WOOD WORKING digest

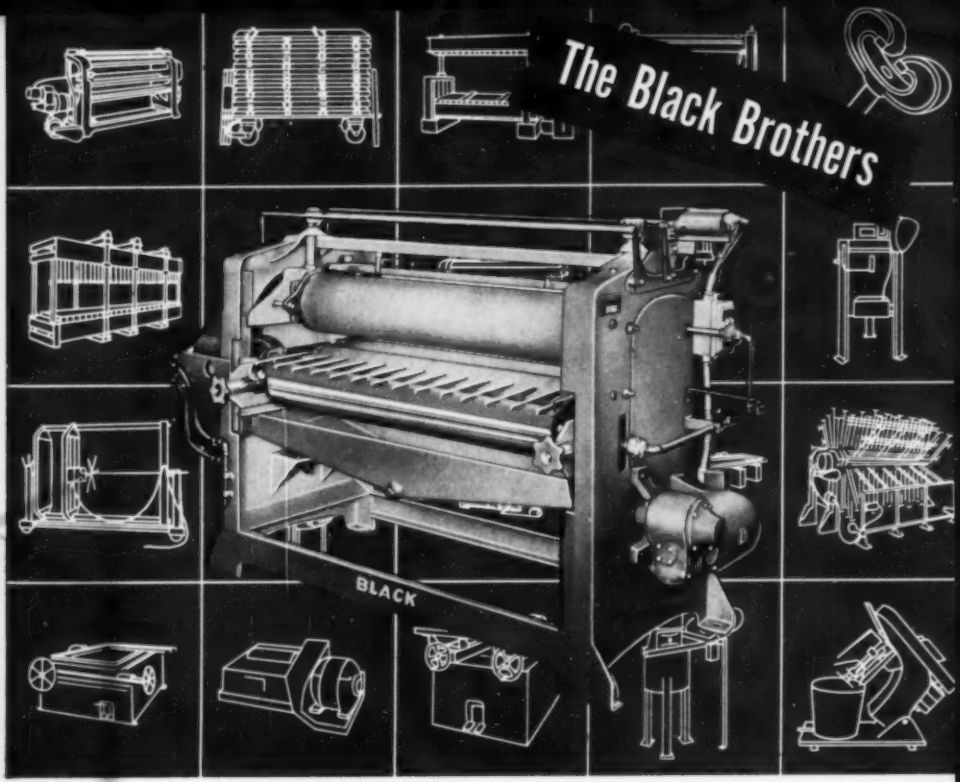
THE INDUSTRY'S *No. 1* PUBLICATION

in

- Editorial Content
- Advertising Volume
- Effective Circulation

PUBLISHED MONTHLY SINCE 1898

A HITCHCOCK PUBLICATION



A Complete Line of Laminating & Gluing Equipment

Black Brothers manufacture a complete line of laminating and gluing equipment of nationally recognized superiority. Illustrated above is a No. 22-D resilient roll, ball bearing glue spreader equipped with water cooled doctor rolls as an optional extra for use with quick setting glues. Gluing rolls are deeply covered with fine synthetic rubber, and are specially grooved to control the amount of resins deposited and to conform to irregularities in the veneer. Accurate, heavy duty ball bearings are sealed to keep lubricants in, and dirt and glue out. Black's 22-D Spreader for resins, casein, and other cold glues is unmatched in speed, economy, accuracy, cleanliness and quality production. Write for details today . . . or let us send you a catalog on the complete Black line.

"If It is Gluing Equipment—We Have It"

THE BLACK BROTHERS CO., Inc.

Mendota, Illinois

Plane it extra smooth . . . and fast . . . with this "Oliver" Surfacer

- One-piece Cabinet Base
- Three-point Floor Support
- One-piece Upper Housing for permanent and perfect alignment
- A New Chipbreaker cannot stick or clog
- Totally enclosed Feed Mechanism

The "Oliver" No. 261 Single Surfacer planes hard and soft woods up to 30" wide, 8" thick, up to 60 lineal feet a minute — faster, if desired. Owners of leading plants find its super-smooth work greatly reduces finishing costs.

This Planer has a totally enclosed ball bearing worm gear drive for the feed rolls. The lubricated chipbreaker cannot stick or clog. The cylinder, carrying four knives, is brought to a quick stop by a convenient hand brake.

Precision ball bearings are used for all revolving parts and thrusts under adjusting screws. Controls are in easy reach of operator for making quick and easy adjustments. Write for Bulletin No. 261.

The "Oliver" line includes Hand Planers and Jointers, Surfacers, Power Feed Facers, and the famous Straitoplane—a machine which planes both sides of stock smooth and parallel in one operation.

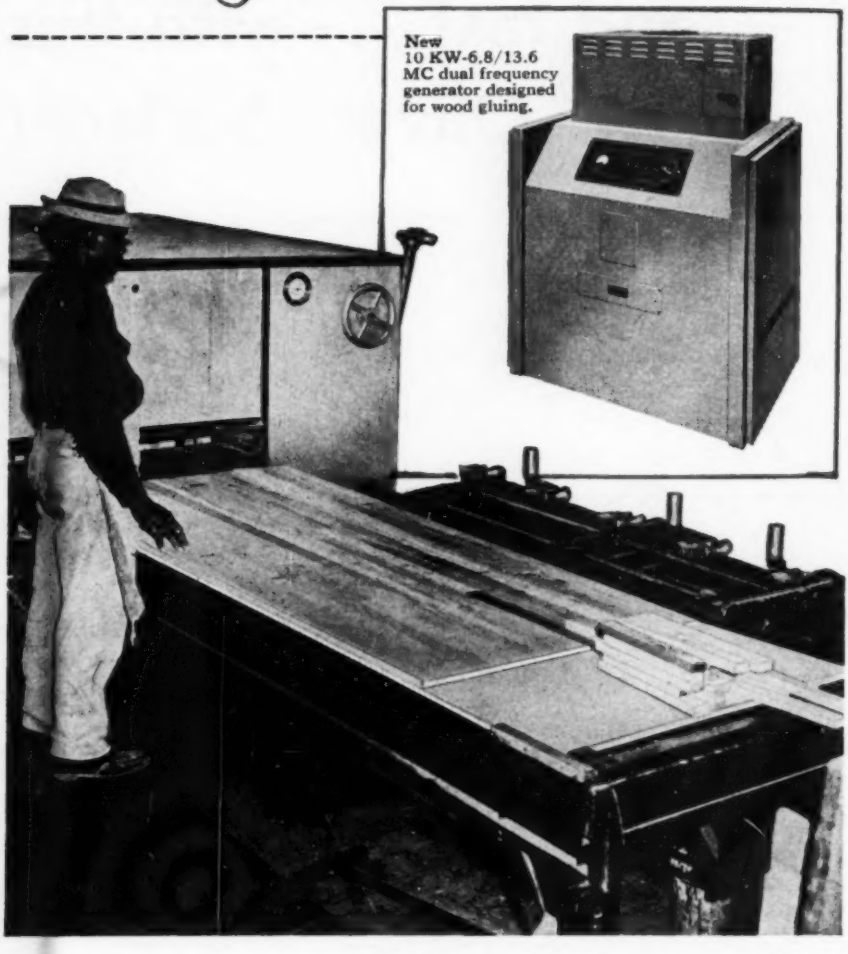
OLIVER MACHINERY COMPANY

GRAND RAPIDS 2, MICHIGAN

Quality Woodworking Machinery since 1890

YOU CAN BE **SURE**... IF IT'S

Westinghouse



A Westinghouse 10KW-5 MC generator and a Weldon-Flinchbaugh panel press produce phenomenal savings in costs and materials at Bradley Plywood Co.

Part-Time SAVINGS

$26,000 A YEAR!

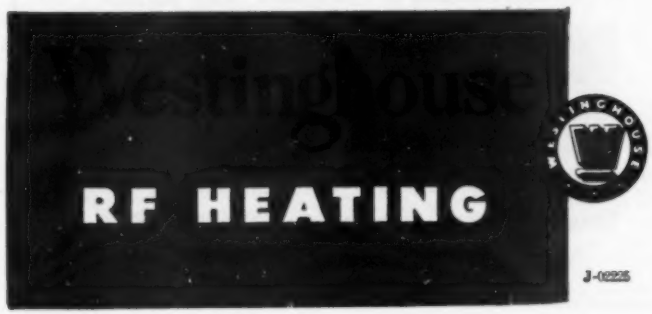
RF gluing equipment is used in new, efficient and productive ways by Bradley Plywood Company, Savannah, Georgia. For one day a week Bradley's RF equipment glues scrap wood salvaged by them to make lumber core panels, desk-top cores and other items.

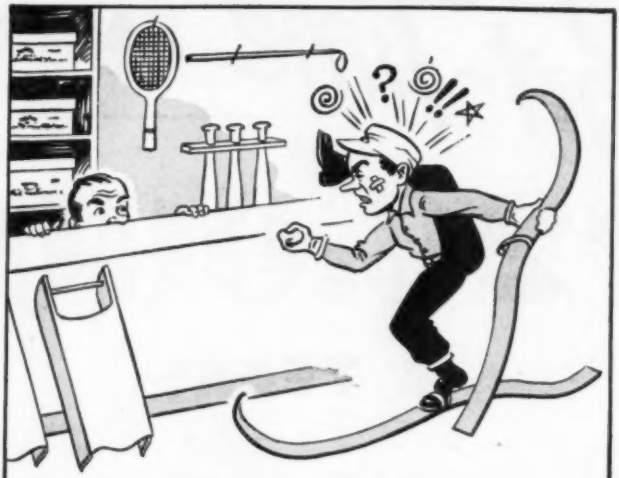
On scrap-wood gluing alone, Bradley saves $26,000 a year!

Bradley spends the other four days a week on RF gluing of core-stock panels from standard size lumber. With RF heating, production has tripled, costs have been halved.

For full-time operation, the $26,000 scrap-wood savings plus an annual saving of more than $36,000 in normal operations paid for the installation in less than three months. There have been added benefits: fewer rejects, less glue, less planing, less floor area.

Today, scarcities demand savings. For savings information, call your Westinghouse representative. Or write Westinghouse Electric Corporation, Department W-3, 2519 Wilkens Avenue, Baltimore 3, Maryland; ask for the booklet B3946B covering *"RF Heating for the Woodworking Industry."*





Did anyone ever mention a little thing called ***green lumber*** *to you?*

YOU CAN'T AFFORD TO LOSE MONEY THROUGH GREEN LUMBER REJECTS!

• Standard Dry Kilns are the sure way to *eliminate costly finished product rejects . . . the sure way to better drying results at the lowest operating cost.* With their internal fan construction and automatic reversible cross recirculation, Standard's world famous dry kilns are helping successful operators in every kind of woodworking plant to cut down losses from "green lumber rejects."

Make sure—for new kiln installations, or for remodelling old natural draft type kilns, rely on STANDARD TO SOLVE *YOUR* problem best!

Manufacturers of Internal Fan Kilns

Write for illustrated Standard Catalog

STANDARD

Engineers and Manufacturers Since 1887

DRY KILN COMPANY

P. O. BOX 5708 • INDIANAPOLIS; INDIANA

Woodworking digest

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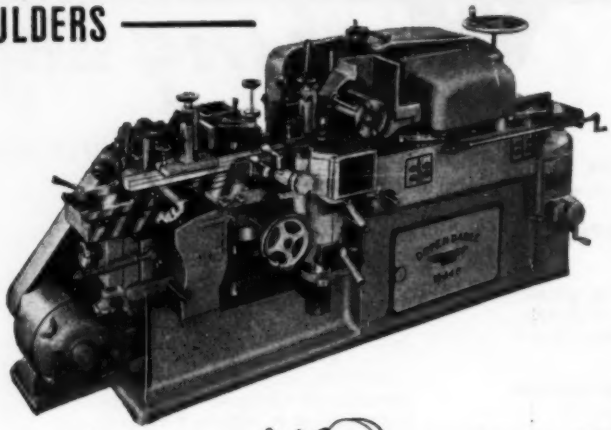
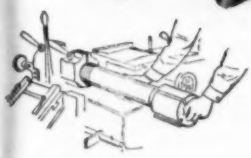
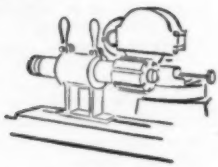
NEW! DEPENDABLE'S ELECTRO-UNIT DRIVE MOULDERS

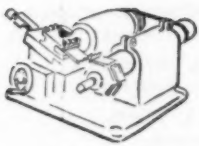




Quick, easy removal of Cartridge Spindle Unit



Head being ground on Cartridge Spindle Unit



Head being jointed on Cartridge Spindle Unit

QUICK SET-UPS, HIGH SPEED, LOW COST FEATURES OF MOULDERS COSTING UP TO 3 TIMES MORE

New cartridge spindle units make it possible to set-up, grind, joint and pre-test all patterns in grinding room. Change in pattern made in one minute.

A moulder man's moulder, in 4, 6 and 8 inch capacities . . . High speed production; heavy cast-iron construction; variable feed; standard high speed spindles without frequency changer; convenient, quick-acting controls; plenty of horsepower through standard motors; 100% ball and roller bearings, pre-lubricated. Less maintenance. Jointer furnished on machine. Designed for top performance in large, medium and small mill operation, multiple and single knife work. Priced so that the smallest shop can afford one.

See your dealer or write to factory for full details.

DEPENDABLE · QUALITY · SERVICE

Dependable MACHINE COMPANY

2320 High Point Road • Greensboro, N. C. • U. S. A.

MOULDERS • KNIFE GRINDERS • HEAD GRINDERS • KNIFE JOINTERS • KNIFE BALANCERS & BIT SAWS

To meet MILITARY SPECIFICATIONS for ADHESIVES and PLYWOOD...

Choose from this broad, quality line of BAKELITE Resins! A Single Convenient Source for the widest variety of needs.

Specification	Date	Recommended BAKELITE Resin	Title
ARMY ORDNANCE			
AXS-1665	10/17/45	BC-17613	Resorcinol resin.
AXS-1666	10/17/45	BC-17613	Glue.
U. S. ARMY			
23-79-D-2	8/2/49	BC-17875	Locker, trunk.
23-115A	2/7/49	BC-17613 (cold, intermed.) BC-17875 (high temperature)	Skis.
91-99	7/6/45	Type I—BCU-40 Type II—QCU-87 Type III—BCU-28	Gluing of wood vehicle parts, general requirements for.
91-111	7/2/47	Same as 91-99	Bodies, cargo, wood, general requirements for.
91-115	9/12/45	Type I—BCU-40	Wood parts, fabricated, for transport vehicle bodies.
NAVY DEPARTMENT			
39-F-3	4/15/47	BC-17613	Fir, Douglas, laminated (for ship use).
39-P-15	12/15/43	QCU-87, BCU-28, BCU-40	Plywood (Naval use).

BAKELITE COMPANY, *A Division of Union Carbide and Carbon Corporation*, 30 E. 42nd St., New York 17

★ ★ ★ ★ BAKELITE Resins for

Specification	Date	Recommended BAKELITE Resin	Title
NAVY DEPARTMENT—Continued			
39-W-2A	12/15/45	BR-15100	Wood, impregnated, compressed.
52-G-11	2/1/45	QCU-87, BCU-28, BCU-40	Glues, resin (urea formaldehyde).
NAVY AERONAUTICAL			
PG-2	1/16/45	Type I, Class 1 or 2, Cond. A—None Type I, Class 1 or 2, Cond. B—None Type I, Class 1 or 2, Cond. C—BC-17613 Type II, Class 1 or 2, Cond. A—None Type II, Class 1 or 2, Cond. B—None Type II, Class 1 or 2, Cond. C—BC-17613	Glue, process for use of phenol-aldehyde resin.
G-35	4/25/45	Type I—Primary—None Secondary—BC-17613 Type II—Primary—None Secondary—BC-17875	Glue, metal-to-wood, sandwich construction.
G-38	6/25/45	Type I—BC-17613	Glue, synthetic resin (plastic to plastic).
U. S. AIR FORCE			
AF-14139	6-22-45	Condition A—None Condition B—BC-17875 Condition C—None	Glue, high-temperature-setting-resin.
AF-14150	9/4/45	Condition A—None Condition B—BC-17875 Condition C—None	Glue, application of high-temperature-setting-resin.
AF-15015-A	1/14/49	See MIL-P-66A	Plywood, plastic-faced.
AF-15027	9/28/49	See MIL-A-397A	Plywood, vulcanized fiber-faced.
AF-15065-B-1	1/21/47	BR-15100	Impregnated wood.
AF-20041-2	4/6/45	QCU-87, BCU-28, BCU-40	Panels, comp. wood, impreg.
AF-29538-A	2/4/46	BR-15100	Blank, propeller, compressed wood.
FEDERAL			
AA-C-281 (1)	2/17/47	See CG-496 (2)	Chairs, bent wood.
NN-B-476	12/30/44	QCU-87, BCU-28, BCU-40	Blocks, and tables, meat.
CG-496 (2)	9/14/44	QCU-87, BCU-28, BCU-40	Glue, resin-type (liquid and powder).

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Military Specifications ★ ★ ★ ★

Specification	Date	Recommended BAKELITE Resin	Title
FEDERAL—Continued			
NN-B-601-B	10/8/47	Type A—BCU-40, QCU-57 Type B—BCU-40, QCU-57, BCU-22 Type C—BCU-40, QCU-57, BCU-28, BCU-22	Boxes, wood-cleated plywood.
MILITARY			
MIL-A-397A	4/6/51	Type I, Class 1, Cond. A—None Type I, Class 1 or 2, Cond. B—None Type I, Class 1 or 2, Cond. C—BC-17613 Type II, Class 1 or 2, Cond. A—None Type II, Class 1 or 2, Cond. B—None Type II, Class 1 or 2, Cond. C—BC-17613	Adhesive, room-temperature, and intermediate-temperature-setting-resin.
MIL-P-66A	12/27/49	Type I—BCU-40, BCU-22, BCU-28, BCU-50, QCU-57, QCU-87 Type II—BCU-40, BCU-28, BCU-22, BCU-50, QCU-57, QCU-87 Type III—BCU-40, BCU-28, BCU-22 BCU-50, QCU-57, QCU-87 Marine—BC-17875 Hutment—BCU-40, BCU-28, BCU-22, BCU-50, QCU-57, QCU-87	Plywood, flat-panel.
MIL-A-5433A	3/13/51	Method I—See MIL-A-397A, Type I Method II—See MIL-A-397A, Type II, Class 1—BC-17613	Adhesive; application of room-temperature and intermediate-temperature-setting-resin.
MIL-A-5534	1/9/50	Condition A—None Condition B—BC-17875	Adhesive; high-temperature setting-resin.
MIL-A-5535A	3/12/51	See MIL-A-5534 Condition A—None Condition B—BC-17875	Adhesive; application of high-temperature-setting-resin.
MIL-F-10090	1/11/48	Plywood and furniture panels: BCU-1, BCU-28, BCU-22 Assembly glue: BC-17613	Furniture; wood, tables, for officers and non-commissioned officers.
MIL-F-10091	12/17/47	Plywood and furniture panels: BCU-40, BCU-28, BCU-22 Assembly glue: BC-17613	Furniture; wood, chairs, for officers and non-commissioned officers' quarters.
MIL-G-6803	6/22/50	QCU-87, BCU-28, BCU-40	Glue; application of cold-setting resin.
MIL-P-6069	3/29/50	BC-17875	Plywood; aircraft, molded.
MIL-P-6070	3/29/50	BC-17875	Plywood and veneer; aircraft flat panel.

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BAKELITE Resins for Military Specifications

Specification	Date	Recommended BAKELITE Resin	Title
MILITARY—Continued			
MIL-F-2319	12/3/48	BC-17613 (Room, Intermed.); BC-17875 (High temp.); BCU-28, BCU-40 (Urea)	Furniture; wood, case goods for officers' and non-commissioned officers' quarters.
MIL-F-10089	1/13/50	Plywood—BC-17875 Assembly—BC-17613	Furniture; composite metal and wood.
JOINT ARMY-NAVY			
JAN-P-105A	2/20/45	See JAN-P-139	Packaging and packing for overseas shipment. Boxes, wood-cleated plywood.
JAN-P-112	0/31/44	BCU-40, BCU-22, BCU-28	Packaging and packing for overseas shipment, drums, plywood.
JAN-P-139	8/22/46	Type A—BC-17875 Type B—BCU-40, BCU-28, BCU-22	Packaging and packing for overseas shipment, plywood, container grade.
JAN-F-241	4/25/46	QCU-87, BCU-28, BCU-40	Floats, life, balsa wood.
ARMY QUARTERMASTER			
CQD-101B	0/27/43	BCU-28, BCU-40, BCU-22	Chests, desks, fiber.
BQD-134A	6/14/45	Type I—BCU-40 Type II—BCU-28	Sled, toboggan.
CQD-203-A	5/24/45	Type I—BCU-40 Type II—QCU-87, BCU-28, BCU-40 Type III—BCU-28	Sled, cargo.

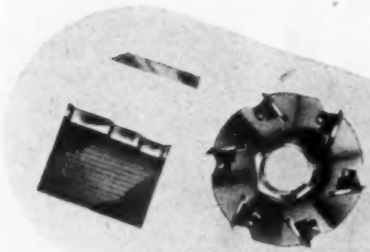
Yours for the asking!
A 24" x 17" enlargement of this Table of Military Specifications.
Write Dept. CR-27.

BAKELITE COMPANY, *A Division of Union Carbide and Carbon Corporation,* 30 E. 42nd St., New York 17

top *production results when using* BADGER *heads*

WHETHER IT'S A SHORT RUN USING A SQUARE HEAD WITH GROUND-TO-PATTERN KNIVES

Where the knife bite is deepest . . . and the spindle speed the most terrific . . . you will find BADGER heads and knives giving you SMOOTH, SAFE and ACCURATE performance . . . and SETTING MACHINE PRODUCTION RECORDS!

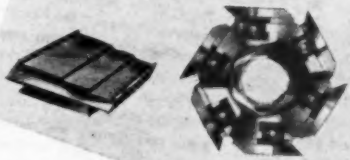


A ROUND CORRUGATED HEAD WITH GROUND-TO-PATTERN KNIVES

HAVING A TROUBLESOME MACHINING PROBLEM?

Our engineers will be glad to help you. Send wood sample or sketch of pattern desired; spindle diameter; H. P. and R. P. M. of motor; type and make of machine; maximum width of stock; and state which type of head desired.

OR WHETHER IT'S A LONG PRODUCTION RUN USING CLAMP "T" SLOT HEADS WITH MILLED-TO-PATTERN BITS



Engineers for the Woodworking Industry

CUTTERHEADS BADGER KNIVES

WISCONSIN KNIFE WORKS BELOIT WISCONSIN

Every BUSS Planer Feature

1. Strong, compact, heavy — the weight is in the frame, side plates, and beds. **2.** Accessible — every working part is reached from the outside through light, convenient doors. **3.** Every working part is completely enclosed — the safest Surfacer built. **4.** Bearings — all anti-friction ball and roller. **5.** Completely motorized — motor on cutterhead arbor; motor grinder; motor feed; built-in reduction gear unit, Vari-feeds 23 to 68 feet per minute. **6.** Sectional Roll and Sectional Chipbreaker, independent yield 3/8", allows multiple feeding. **7.** Center Table and Pressure Bar chromium plated for long wear. **8.** Hand lever Micrometer Control for Pressure Bar — parallel changing of the bar in the thousandths as knives wear and material changes. **9.** Hand setting Micrometer Controlled Rolls — act simultaneously to conform with the changing conditions of the under side of the material. **10.** Graduated Set Dial Inside of Handwheel for .001" Bed Setting. **11.** One-Shot Lubrication — oil force fed to all roll gears, gear teeth, roll boxes, every moving part; no part missed; no time out for oiling; maintains new machine accuracy. **12.** Push Button Controls. **13.** Buss Planers are tested out under a full pressure exhaust system with several truck loads of panel stock — insures the user of a properly adjusted and set surfacer, ready to give production work.

Write for new bulletin No. 61, just issued.
Get all the facts and you will agree that the 4-L Planer has no equal.

MACHINE SQUEALS?

Pressure Bar is probably dragging. In Buss planers proper adjustment can be made with a flick of the MICRO-CENTRAL Control.

PRECISION BUSS PLANERS

BUSS
SINCE 1862
MACHINE WORKS

234 EIGHTH ST.,
HOLLAND, MICHIGAN

Here's how to slash your Bonding Cost by 25%!

USE PENACOLITE® ADHESIVE G-1260
(a modified resorcinol-formaldehyde resin adhesive)

IT COSTS ¼ LESS THAN STRAIGHT RESORCINOL ADHESIVES

GIVES COMPARABLE RESULTS
(proved by Vacuum-Pressure Cycle Tests)

● By using phenol-modified Penacolite Adhesive G-1260 you save nearly half the scarce resorcinol otherwise required—an important factor in view of the current shortage of resorcinol due to heavy defense demands, and resultant restrictions on resorcinol by NPA.

Penacolite Adhesive G-1260 is easy to use. It cures at *room temperatures* . . . no corrosive catalysts or special applicators are needed. The durability of Penacolite G-1260 bonds has been proved by gruelling Vacuum-Pressure Cycle Tests under Specification MIL-A-397A. The bonds are unaffected by molds, fungi, most organic solvents and acids. They will not deteriorate with age.

Penacolite Adhesive G-1260 provides unusually effective bonds between wood, treated woods, many plastics, natural and most synthetic rubbers, primed metals, and porous materials such as paper, leather, textiles, plaster, cement, fiberboard, and asbestos boards.

If you are engaged in defense work, get in touch with your nearest Koppers Chemical Division office, now, and arrange for your supply of money-saving, rugged-strength Penacolite Adhesive G-1260. And if you need our technical service, we're always on call. *Experience with, and a setup to handle economical G-1260, may be a big advantage in future civilian production.*

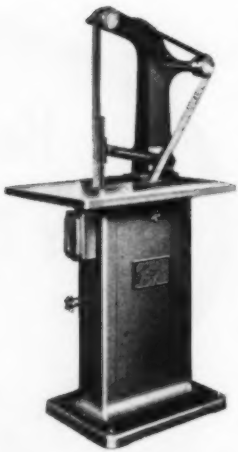
KOPPERS COMPANY, INC.
Chemical Division, Dept. WWD-11, Koppers Bldg., Pittsburgh 19, Pa.

® KOPPERS **PENACOLITE RESORCINOL ADHESIVES**

SCROLL SANDERS

For sanding scrolled edges, produced by either a high speed router or a scroll saw, where a smooth finish is required, the ECCo No. 23 and No. 123 Scroll Sanders will be found ideal. These machines will do the work of three or four men using hand methods, and will produce a finish smoother than that attainable by hand.

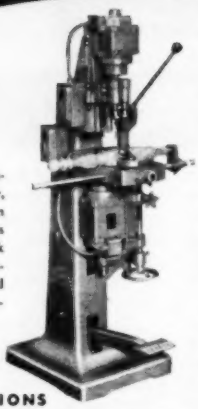
CONDENSED SPECIFICATIONS		
	No. 23	No. 123
Work Table Size	22" x 30"	22" x 30"
Height, Floor to Table	37"	37"
Abrasive Belt Travel FPM	900	900
Abrasive Belt Length	103"	178"
Overall Height	40"	68"
Floor Space Required	24" x 30"	24" x 34"



EKSTROM, CARLSON

No. 167
BED LOCK MACHINE

This machine is designed for manufacturers of quality bedroom furniture, and is indispensable for production grooving and boring of bed posts and rails. It eliminates guess work and slow try-and-fit methods by cabinet makers. Because of its speed and accuracy, it is a highly efficient addition to any manufacturing plant.



CONDENSED SPECIFICATIONS

	No. 167
Boring Spindle RPM	4000
Distance Between Spindles	3"
Maximum Spindle Travel	4"

Grooving Saw RPM	3600
Saw Cut Length, Max	6½"
Saw Cut Depth, Max	1⅝"
Size of Work Table	11" x 14"

Nos. 102 and 104
SINGLE SPINDLE CARVING MACHINES

These machines are smooth and vibrationless in operation — sturdy, compact, and convenient in design. They are quality wood-carving machine tools, designed for delicate, light, or heavy work — and are moderately priced to meet your approval.

CONDENSED SPECIFICATIONS

	No. 102	No. 104
Cutter Spindle RPM	10,000	8,500
Height, Floor to Spindle	45"	45"
Thread Size, Main Spindle	9/16" - 20	9/16" - 20
Thread Size, First Extension	3/8" - 24	3/8" - 24
Thread Size, Second Extension	3/16" - 24	3/16" - 24
Floor Space Required	40" x 42"	44" x 46"

WRITE FOR LITERATURE ON ALL THESE MACHINES

EKSTROM, CARLSON & COMPANY

1411 RAILROAD AVE. • ROCKFORD, ILLINOIS

CONTINENTAL SCREW COMPANY
INC. ★ 1904

You can count on Continental

CONTINENTAL SCREW COMPANY
New Bedford, Mass.

Manufacturers of famous HOLTITE-Phillips and Slotted Head Screws and Bolts and Allied Fastenings, both Special and Standard

HOLTITE *Engineered* FASTENINGS

Firstest with the Mostest

Anticipating the needs of the woodworking industry,
Raybond was the *first* one-man high-frequency panel gluing machine.
Raybond, during *4* years of use and field testing,
has been constantly improved. Raybond—the *most* complete one-man unit includes high-frequency generator, glue spreader, loading and unloading tables, plus installation.

Standard Model 1-H, *illustrated.* Panel size: maximum 37½" wide x 50" long. $9,625 FOB, Newton. Other models available up to 50" x 100".
Production of one man from 3000 to 8000 surface feet per day depending upon machine size and stock lay-up.

Why speculate—buy the time-tested, proven Raybond

Raybond normally pays for itself *out of savings* in one to three years — In some instances six months — write today for brochure.

ELECTRONIC HEATING CORP. 66 NEEDHAM STREET

NEWTON HIGHLANDS, MASS.

Electronic Veneer on Frame Press
Electronic Edge Banding Press
Electronic Post Gluing Press.
Portable Wood-Bonding Gun
Special Assembly Jigs and Presses

WHITNEY
No. 97 Double Surfacer

Feeds, 30 to 90 feet per minute.
Planes stock 1/16" to 7" thick.
30", 36", 40" and 44" widths.

There's a WHITNEY for every Planing need

Whether for your finest cabinet surfacing or fast, tough, continuous, day in and day out production planing — there's a Whitney to meet your requirements, and to assure smooth, accurate surfaces and dependable performance. The answer to the Whitney's accuracy and dependable performance is Whitney's long experience in planer design, precision construction and traditional Whitney workmanship. If you demand quality production, economy and dependability don't settle for less than a Whitney. Investigate the Whitney 97 Double Surfacer today. Write for new bulletin D11 just off the press.

WHITNEY PLANERS
S-M-O-O-T-H
ACCURATE

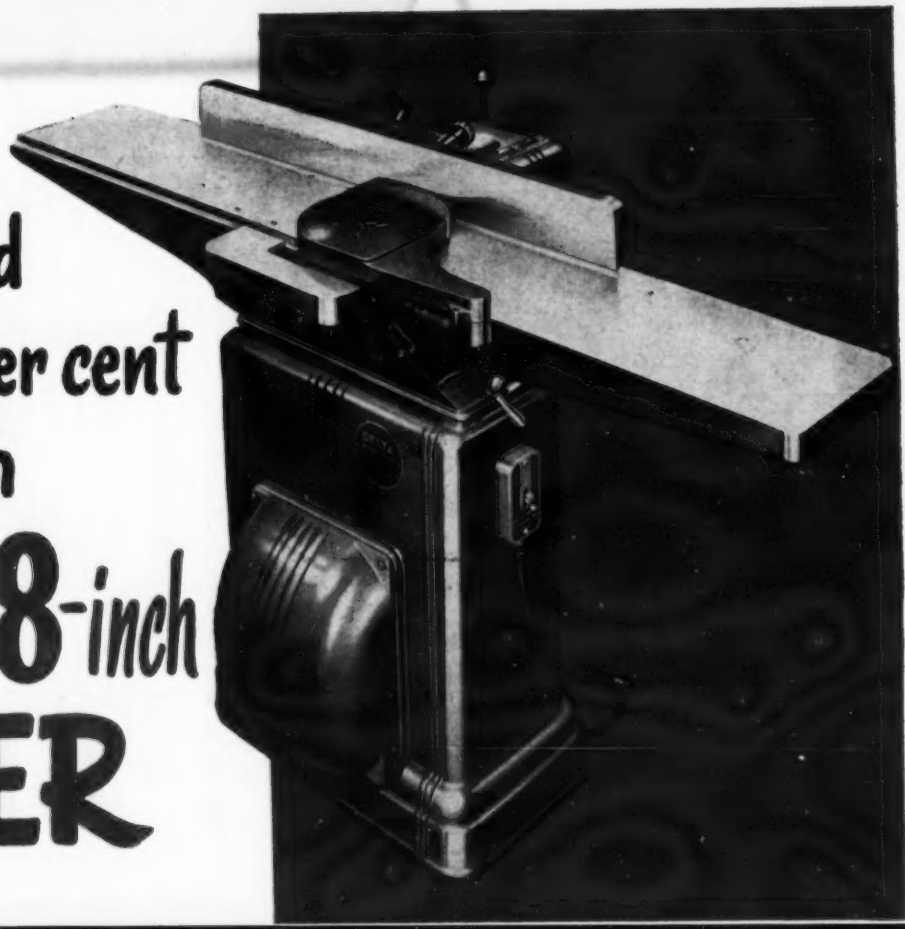
BAXTER D. WHITNEY & SON., Inc.
WINCHENDON, MASSACHUSETTS, U.S.A.

IN OUR 114th YEAR

PLANERS • SHAPERS • VARIETY SAWS
AUTOMATIC SHAPERS • MORTISERS • BACK KNIFE LATHES

You get
smoother,
better finished
cuts 33⅓ per cent
faster with

DELTA 8-inch JOINTER



Because it has four cutting knives, the Delta 8-inch Jointer cuts one-third faster than a 3-knife machine—true, square precision cuts for all work requiring utmost accuracy.

A quick check of the vital quality features of this outstanding Delta Tool will indicate instantly why it is a real favorite in woodworking shops for all precision jobs.

It is ruggedly built—a fine investment that will last for years. It is versatile—does many jobs and does them all well. It is truly a fool-proof machine that enables your ordinary worker to do precision work.

COMPARE THESE VITAL DELTA-QUALITY FEATURES!

★ 60" x 9¾" finish-ground table provides extra large space and firm support for work alignment.

★ 4-knife cutterhead mounted on sealed lubricated-for-life ball bearings—at 4100 rpm gives better quality finish, increased production.

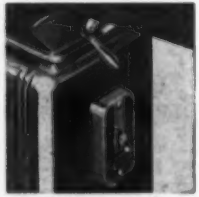
★ Cutterhead guard provides maximum protection. Easily removable for rabbeting, and instantly replaceable.

★ Large, heavy rabbeting arm 4" x 11¾" gives effective support for making big rabbet cuts ½" deep to 8" wide, quickly and accurately.

★ 4" x 34" fence, finish-ground and rigid, tilts 45° both ways for accurate bevel jointing; mounting base acts as rear knife guard.

★ Worm gear adjusts tilt accurately; fence locks securely in position by tightening nut with dual control handle.

★ Tables raise and lower independently up to ½". Hand wheel provides easy adjustment.



★ Safety type switch can be padlocked—provides added protection, prevents unintentional starting.

For your Delta dealer, see your Classified Phone Directory under "Tools" or send this coupon for his name and address.

It's easy to find out how the Delta 8-inch Jointer will speed your production and save you money—just send the coupon.

There's a Delta Power Tool for Your Job-

WOOD OR METAL WORKING

53 MACHINES • 246 MODELS

More Than 1300 ACCESSORIES

DELTA POWER TOOL DIVISION

MILWAUKEE

Rockwell

MANUFACTURING COMPANY

661M E. VIENNA AVENUE • MILWAUKEE 1, WIS.

☐ Send literature on the Delta 8-inch Jointer and other tools.
☐ Please send name of the nearest Delta Dealer.

Name _____ Position _____

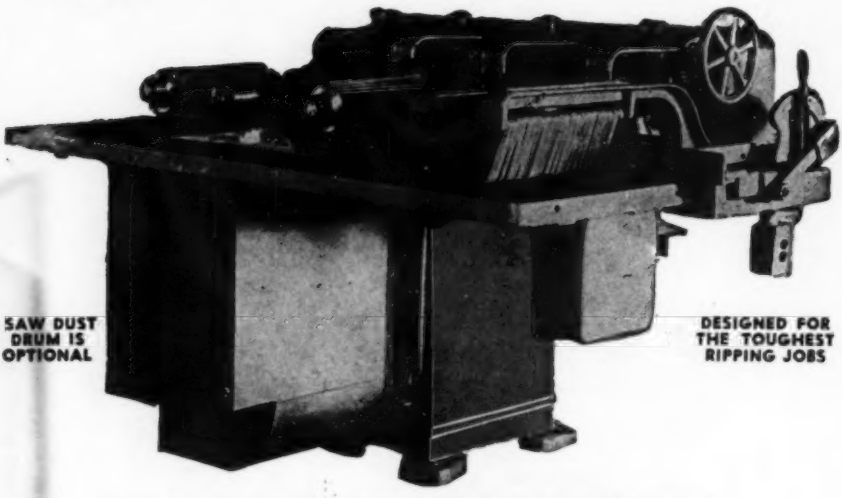
Company _____

Address _____

City _____ Zone _____ State _____

A REAL HUSKY...

NO. 213 A MODERNIZED HOOSIER SELF FEED RIP SAW



SAW DUST DRUM IS OPTIONAL

DESIGNED FOR THE TOUGHEST RIPPING JOBS

FOR QUICK OPERATION - DEPENDABLE PERFORMANCE

This sturdy unit is designed specifically for high speed ripping of stock longer than 24" and as a gang ripper for stock as short as 12". The No. 213 is equipped with a stationary table top having all feed works brackets bolted to the top—as is the gear reduction drive. The mandrel rides on ball bearings and is raised and lowered quickly by a hydraulic cylinder. Eight driven rolls feed the stock through the saw at high speed. A 50 H. P. motor drives this unit at full capacity. The No. 213 is a real workhorse, built to handle your toughest jobs.

Available for direct motor or V belt drive.

SINKER-DAVIS *Company*

230-250 SOUTH MISSOURI ST. DEPT. 0 INDIANAPOLIS, INDIANA

WHAT *Casie* CAN'T DO. *Resie* CAN!

Here's something important for a glue buyer to remember —

(1) that if there wasn't a pound of urea to be had tomorrow — NATIONAL CASEIN would be able to supply your glue needs.

(2) that if casein disappeared suddenly from the market, NCC would be able to supply you with a resin formula.

No National Casein customer is dependent upon one type of adhesive — nor are NCC's field representatives limited to a single glue type or formula to meet your requirements.

"Casie" and "Resie" will tell you that if one of them can't do your glue job, the other can.

Try us. Your inquiry incurs no obligation.

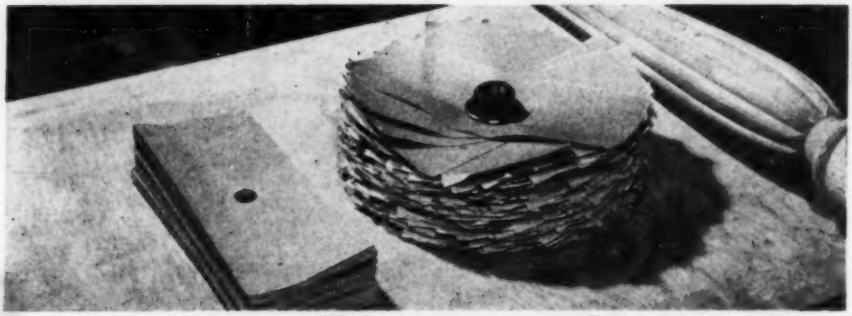
National Casein

No Glue Problem— Casein or Resin—is too Little, too Big, or too Tough!

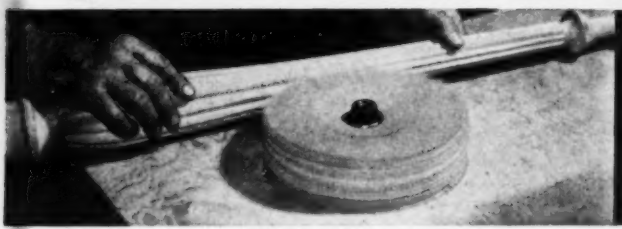
605-19 West 80th Street, Chicago 20, Illinois • Broad & Fulton Sts., Riverton, New Jersey

This "form-fitting" sander

OF DOUBLE-FACED GARNET FINISHING PAPER



is great on flutes and grooves



Another production pusher by . . .
BEHR-MANNING APPLICATION ENGINEERING

You take a stack of GARNET Finishing Paper sheets, 4" x 10", coated both sides and punched for the arbor. The stack can be anywhere from 25 to 100 sheets, depending on the job. Set them up staggered to form a loose buff, as in the top picture, start the spindle — and you have as slick an arrangement as you could want for getting into and around formed, turned or irregular shaped work. Good on horizontal as well as vertical spindles, and works equally well on wood, plastics, molded rubber, etc.

You can get Double-Faced GARNET Finishing Paper in a wide range of grits, in the 4" x 10" size, and punched ready for use.

Your Behr-Manning Field Representative can help your production with ideas like this just for the asking. Address Dept. WD-11.

BEHR-MANNING ®

NORTON abrasives ®

BEHR-MANNING DIVISION OF NORTON CO.

TROY, N. Y.

COATED ABRASIVES • SHARPENING STONES

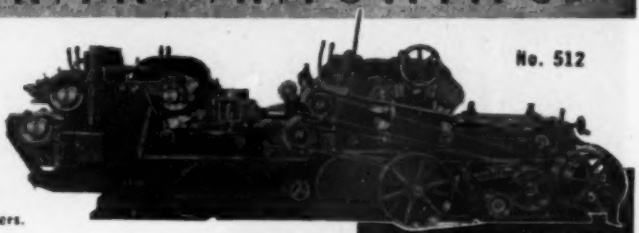
PRESSURE-SENSITIVE TAPES

Export: Behr-Manning Overseas Inc., New Rochelle, N. Y., U.S.

Canada: Behr-Manning (Canada) Ltd., Brantford, Ont.

NEWMAN MACHINES

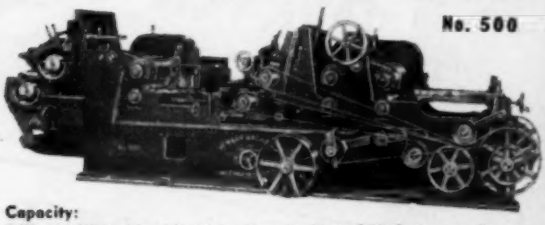
Newman



No. 512

Capacity: 16" and 24" wide, 8" thick. Speeds up to 325 feet per minute. 8" dia. cutting circle. Six 12" dia. feed rolls. Single and double profilers.

BALL and ROLLER BEARING PLANERS AND MATCHERS



No. 500

Capacity: 14" and 24" wide, 6" thick. Speeds 40 to 200 feet per minute. 7" cutting circle. Six alloy steel feed rolls. High carbon special alloy steel cylinders. Single or double profilers.

ORDER NOW FOR EARLY DELIVERY

ALL NEWMAN cylinders or heads are DYNETRICALLY BALANCED insuring an accurate and superbly finished product.

The ball bearing NEWMAN 71 (shown below) will grind all sizes of cutter heads. Table is 33" long by 9" wide with horizontal travel of 25" and is heavily ribbed to maintain accuracy over entire travel. Maximum cutter head swing is 11".

HEAD GRINDER **No. 71**

Ball and Roller Bearings

No. 55 AUTOMATIC PINEAPPLE FEED TABLE

The NEWMAN 55 feeds stock automatically to high speed planers and matchers up to 450 lineal feet per minute. Capacity: 30" wide, 8" thick. All adjustments and controls are centrally and conveniently located.

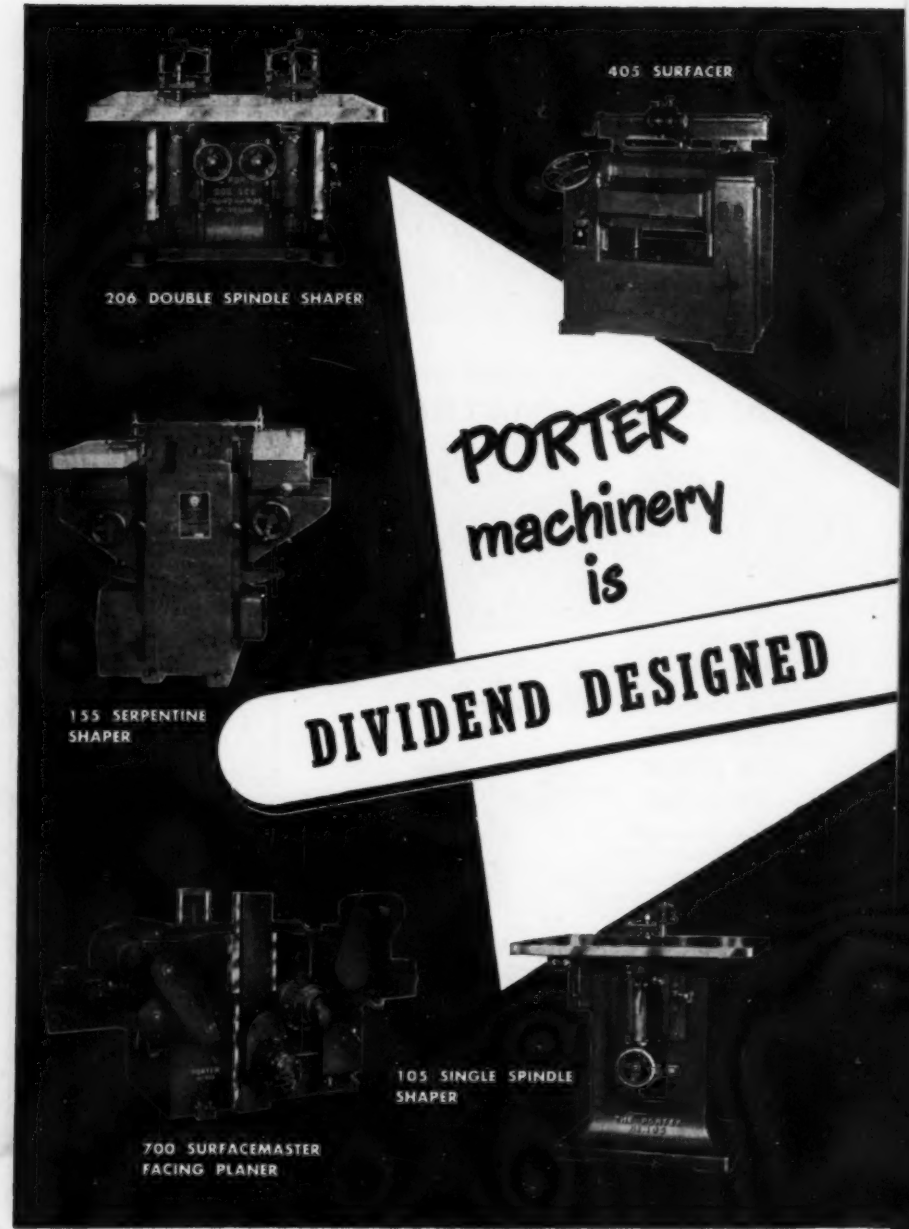
No. 8-B PLANER, MATCHER AND MOLDER

The NEWMAN 8-B planes 22" wide and 8" thick, joints 4" thick and will match 14" wide. 6" diameter feed rolls. Speeds of 30, 50 and 75 feet per minute.

Unsurpassed for work in small and medium mills

MAY WE SEND YOU FULL DETAILS?

NEWMAN MACHINE COMPANY, INC.
GREENSBORO, NORTH CAROLINA, U.S.A.

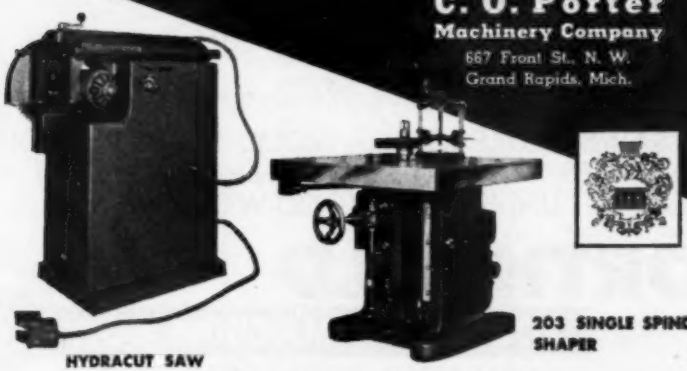

405 SURFACER
206 DOUBLE SPINDLE SHAPER
PORTER
machinery
is
DIVIDEND DESIGNED
155 SERPENTINE
SHAPER
105 SINGLE SPINDLE
SHAPER
700 SURFACEMASTER
FACING PLANER

. . . to give you more production for every dollar you spend

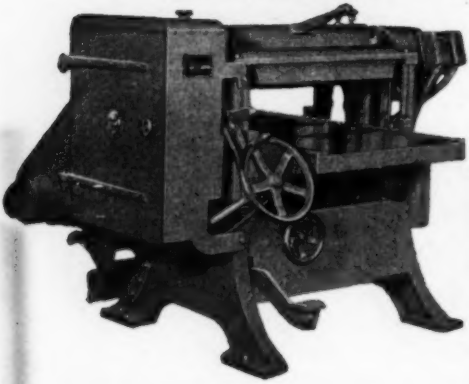
Buying Porter DIVIDEND DESIGNED Machinery is like buying custom-built furniture at a popular price. You get so much more for your money. Your cost per job is less because Porter Machines are faster, take heavier cuts and require less adjusting. They have an extra margin of speed, capacity and strength not found in ordinary machines.

If you need a Router, Saw, Shaper, Planer, Carver, Jointer, Surfacer or Serpentine Shaper it will pay you to investigate Porter, the machinery designed for greater dividends.

C. O. Porter
Machinery Company
667 Front St., N. W.
Grand Rapids, Mich.



NORTHFIELD No. 5 SINGLE SURFACER



The NORTHFIELD No. 5 Single Surfacer is designed and built for heavy production purposes. It is ideal for pattern shops, sash and door and furniture plants.

It handles material up to 24" wide, ⅛" to 6" thick at a choice of speeds from 18" to 36" per minute.

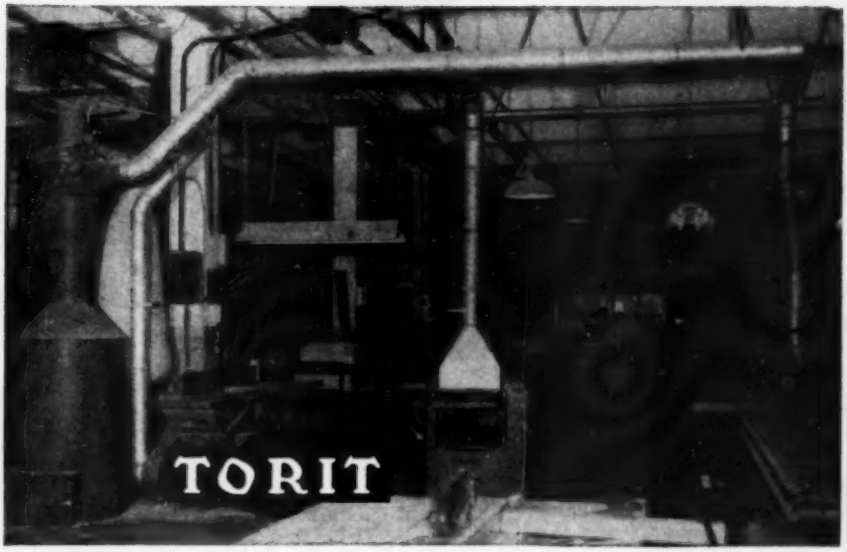
Separate magnetic starters with push button controls are used for each of the two motors. Pressure bars work independently of each other close to knives permitting smooth planing without dubbing ends.

Write for complete information.

High Speed, Precision Woodworking Equipment

BAND SAWS · SURFACERS · WOOD SHAPERS · JOINTERS
SAW TABLES · MORTISERS (Chain and Hollow Chisel)
UNIVERSAL WOOD-WORKERS

NORTHFIELD
FOUNDRY & MACHINE CO.
NORTHFIELD, MINNESOTA., U. S. A.



It's Three to One

for a better dust-collecting job with this

TORIT DUST SEPARATOR

Torit Dust Collectors are also available in self-contained cabinet type units for carrying away dust-laden air around grinding, cutting and polishing wheels.

The jointer, the planer and the spindle shaper, all are connected to one No. 19-FB Torit Dust Separator. One at a time, or even with two machines operating, this unit collects the dust efficiently.

No extensive piping is necessary with Torit dust collecting equipment. They can be wired through machine starting switches to operate simultaneously, and they clean the air so thoroughly that outside exhausts are unnecessary.

Note, too, the 15 cubic foot capacity of the storage reservoir of the unit above. Made especially for this service is shows the adaptability of Torit dust collecting equipment to every situation where dust creates a problem.

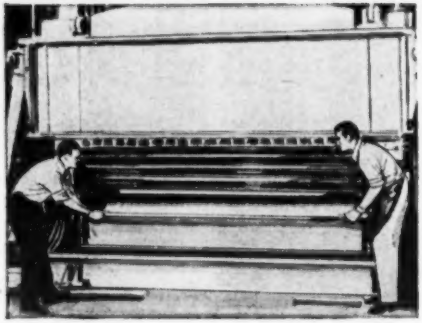
For complete information on how to solve your dust problems, and the latest Torit catalog, write:

TORIT MANUFACTURING CO.

294 Walnut Street St. Paul 2, Minn.

Borden's GLUE News

New glues and improvements in woodworking to help you speed production and cut costs



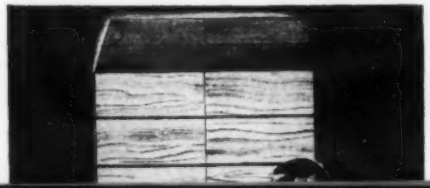
TROUBLE-SHOOTING CHART ON PLYWOOD

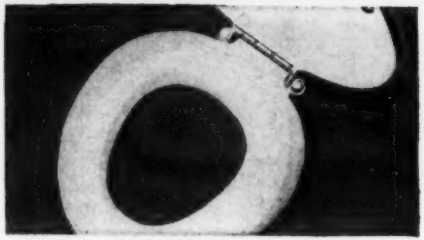
It's not always easy to find the reason for faulty gluing of hot-pressed plywood or furniture panels.

You can learn to spot the causes and cures if you use Borden's "Trouble-shooter" chart. Fully describes the "symp-

HOW TO EFFECTIVELY R/F EDGE-GLUE DENSE WOODS

Set up for these conditions: 1. A square, smooth joint. 2. Good conductivity of glue mix. 3. A time lapse, often 8 to 12 seconds, after application of pressure and before power goes on. It takes a few seconds for rams to pull dense wood surfaces into intimate contact. Heat applied too quickly causes partial precure or weak bond with little penetration. 4. Adequate curing time. Dense woods require almost complete cure as compared to about 60% cure with low density woods.





THERE ARE PROFITS IN WOOD WASTE

With a source of suitable wood waste, the right equipment and the right type of synthetic-resin binders, it is possible to make many types of products now made of solid wood, such as core stock or the toilet seat above.

Borden literature provides a lot of helpful information at no charge. Simply write for these bulletins . . . "General Problems in Making and Marketing Wood-Waste Products", "How to Make Core Stock

toms" to look for, also proper practice in storage, mixing, drying, selecting core stock and veneers, spreading, etc. Write for your free copy.

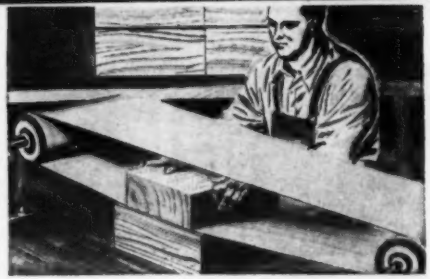
NEW LOWER COST, ROOM-TEMPERATURE-SETTING, PHENOL RESORCIN RESIN GLUE

It's CASCOPHEN LT-68.

More economical because it uses less resorcin . . . yet meets Specification JAN-A-397 for a wood bond that's waterproof, boilproof, moldproof, heatproof. Storage life of over a year at 70 F.

It's also recommended for use with radio-frequency heating equipment. Tests at low density plate voltage of 2 KV and frequency of 8 MC show good bonds, even at 20 seconds, with wood failures up to 100%.

Write for free Bulletin TD-31 for full details.



HOW TO EFFECTIVELY GLUE MASONITE

Large areas of Masonite can generally be bonded satisfactorily with any type of water-base glue (casein, urea resin, resorcin, etc.), using ordinary wood-gluing techniques. In some instances, however, where the Masonite is to be glued to relatively narrow wood frames and a critical bond with full fibre failure is required, these rules should be followed:

1. The pebbly "screened" surface should be sanded smooth for best results.

2. The hard, polished surface of "tempered" boards should not be glued without sanding, unless a solvent is added to the glue. (Five parts of Ethylene Glycol added to 100 parts CASCOPHEN RS-216 and 20 parts Catalyst FM-60M does an excellent job on unsanded, polished "Presdwood" surfaces. Other types of adhesives might also be used in the same way or following wiping of the Masonite surface with the solvent.)

from Wood Chips", "How to Make Hardboard from Sawdust".

NEW, EASIER WAY TO BOND METAL TO WOOD

It's possible to obtain full strength metal-to-wood bonds that show high wood failure without double spreading or high curing temperatures . . . thanks to CASCO FLEXIBLE CEMENT NT-442.

With CASCO, and simple techniques, you can now get strong, water-resistant, metal-to-wood bonds with a single glue application; cold, intermediate or hot press; or with high frequency heating.

Cost is comparable to ordinary wood gluing, with only the usual equipment needed. Casket cases, sink tops, frozen food cases, truck bodies are all being made by these easier techniques.

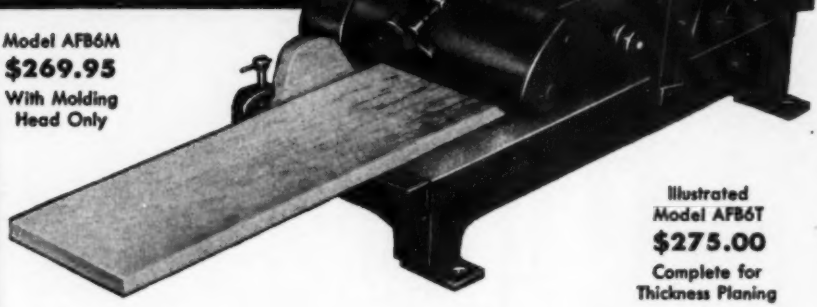
Full data in bulletin, "The Bonding of Metal to Wood". Write for it.

Address any question on the above data, or any gluing problem to

Borden's
CHEMICAL DIVISION
Dept. WD-111, 350 Madison Ave.,
New York 17, N.Y.

NEW AUTOMATIC POWER FEED

MOLDER and PLANER



Model AFB6M
$269.95
With Molding Head Only

Illustrated
Model AFB6T
$275.00
Complete for Thickness Planing

M & M MOLDER-PLANERS

The M&M automatic power feed molder-planer has been designed to meet the production requirements of industrial and commercial plants. Feed capacity on heavy cuts is rated at 12.3 feet per minute, and 40 feet per minute on light cuts. Table is 8" x 22". Arbors may be interchanged for molding or planing in less than five minutes.

In-feed and out-feed rolls are power driven, and are self-compensating for warped stock or variations in thickness. Rubber feed roll discs can be replaced easily and inexpensively. For precision planing and pattern work this new M&M power feed molder-planer will pay for itself in no time.

WRITE FOR COMPLETE INFORMATION

EAGLE SALES CO. KEENE, N. H.

EAGLE SALES CO. KEENE, N.H.

How VEACH-MAY-WILSON gets

continuous high-speed production . . . better quality . . . real economy

with DISSTON Philbrick CUTTER HEADS

Mr. Headrick checking flooring being cut with Disston Philbrick Cutter Heads on high speed flooring machine. ▶

◀ Fred Headrick, Set-Up Man, inspects the Disston Philbrick head used regularly in cutting flooring.

THE PLANT: Hardwood Flooring Mill of Veach-May-Wilson, Inc., Alcoa, Tennessee. Wade H. Headrick, Flooring Superintendent.

THE MACHINE: High-speed, equipped with Disston Philbrick Cutter Heads. Operation is 235 linear ft. per minute. Fred Headrick, Set-Up Man, says, "Disston Heads on this machine give us better matched tongue and groove, and put less load on the motors."

THE OPERATION: Disston Philbrick equipped machine is set in assembly line. Feed to cutter heads is automatic and continuous. Heads cut flooring of oak, hard maple, beech, and other hard flooring woods in various lengths five days a week, eight hours a day. In this operation, Disston Cutters are sharpened every 40 hours compared to every 8 to 10 hours on cutters previously used. Results: *Total life of Disston Cutters is 12 to 14 months, compared with 5 to 6 months for ordinary cutters.*

THE CUTTER HEAD: Disston Philbrick Circular Bit 6" Head. Four of these heads are in continuous operation at Veach-May-Wilson. With the performance record above, it's no wonder that Wade Headrick, Flooring Superintendent, says: "Disston Heads are real money savers. The cutters last longer and need less frequent resharpening. They save us on downtime, labor, cost of cutters, and even cost of grinding wheels. All in all, we figure we couldn't have better cutter heads than Disston!"

• Whatever your problem in woodworking—hard wood flooring, ship lap, drop siding, in fact, for any patterns—you will realize real savings by operating Disston Cutter Heads. Consider these Disston advantages:

1. Precision lapped and ground center hole for true running.
2. Dynamically balanced, Disston Cutter Heads run smoother without vibration or chatter.
3. No holders, clamps, or gibs—knife changes are quick and simple.
4. Built-in chip breakers—no wear on heads from chips.
5. Greater throat room—no loading up and no chip marks on finished work.
6. Disston Engineering means heads designed for accurate, trouble-free work. Special heat-treated alloy steel used in heads is made to Disston's own specifications. And exclusive Disston Philbrick knife-and-head designs permit faster feeds and heavier cuts.

For finer quality output and more footage on less investment, put modern Disston Philbrick Generated Type Heads on your machines!

Disston "Cutting Angles," a new Cutter Head service bulletin, contains helpful information on improving quality and cutting costs in planing mills. Write us if you'd like to receive it regularly. Also FREE wall chart showing standard woodworking patterns.

FIGHT WASTE

"SCRAP TURNED IN . . . IS STEEL TURNED OUT!"

Steel mills urgently need more scrap now. You can help by keeping your steel scrap moving into channels serving steel mills.

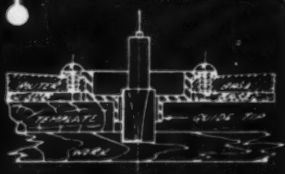
HENRY DISSTON & SONS, INC., 1195 Tacony, Philadelphia 35, Pa., U.S.A.

Pacific Coast Factory: Seattle, Wash. *Canadian Factory:* Toronto 3, Ont.

Only the NEW Stanley

R5B 1 h.p. ROUTER

has this **outstanding** feature



Template guide fastens directly to base . . . . . gives firmer, more precise support.

Most up-to-the-minute Router model in the popular 1 h.p. size, the new Stanley R5B offers even greater value and dependability.

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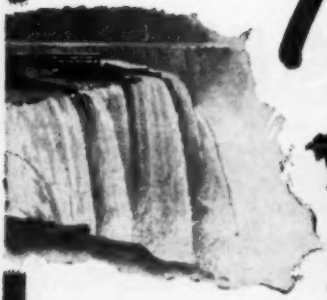

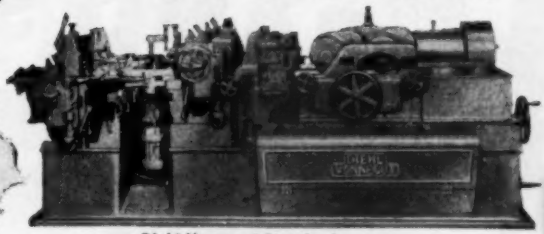

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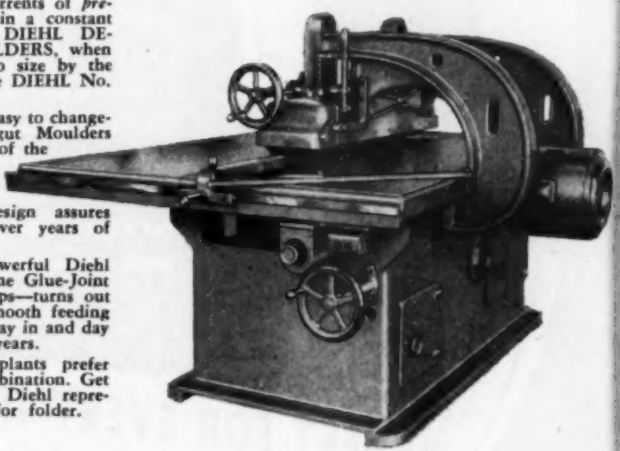

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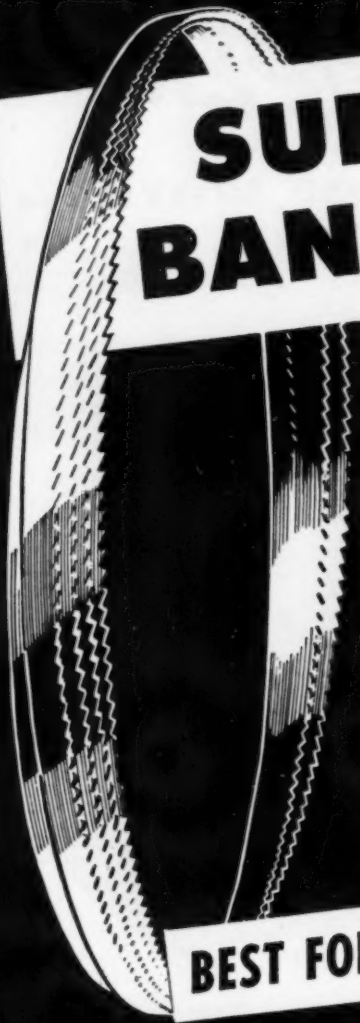

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MUST YOU "WASTE IT"?

At a recent wood products exhibit our attention was directed to several items made by W. Edgar Meeks who has a small plant in northwest Arkansas. It was not so much what Mr. Meeks was making that interested me as it was the materials he was using, although the products themselves were attractive.

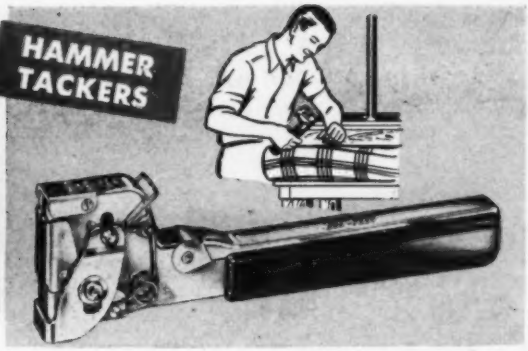
He had on exhibit two numbers made from rough lumber slabs, the outside cuts of the log with the bark still on. They were a wild-bird house and a wild-bird feeder and shelter. Another of his products in this class was a wild-bird feeder made from a two foot piece of a limb about three inches in diameter with food pockets drilled in the sides. He also exhibited picture frames made up of strips cut from pieces of finished lumber—waste pieces 8 to 24 inches long and from ¾ to 2 inches thick.

There are large quantities of "slab lumber" and "short" pieces of finished walnut, maple, cedar, cherry and other good woods available to him in the area where he is located. He gets his raw material for practically nothing and is therefore able to sell his finished products at low prices and a good profit. As you might suspect, Mr. Meek's business is growing rapidly.

Do you have any waste, raw material that you can make into a saleable product in your own plant or do you have a "Mr. Meeks" in your neighborhood? If you want suggestions as to what you could make, drop me a line telling the kind and quantity of waste you have.

Ned Bailey
Editor-in-Chief

DUO-FAST TACKS BETTER QUICKER



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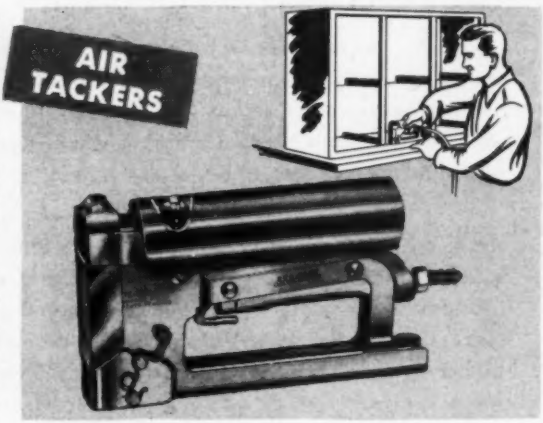
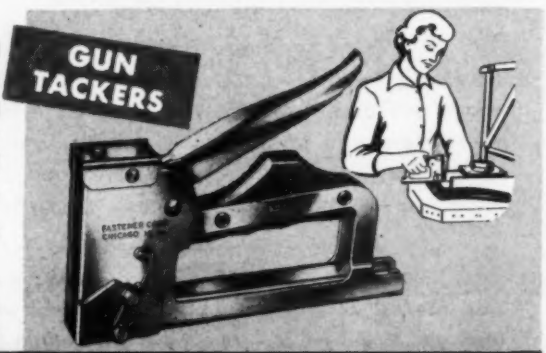


A COMPLETE LINE 85 models available including AIR TACKERS, HAMMER TACKERS, GUN TACKERS, and STRIKE TACKERS. Line includes the one to save you time and money.

DUO-FAST FEATURES all steel construction for long service—Jiffy Jaws for easy cleaning—fast back-end loading—positive driving action—important Duo-Fast Free Service Guarantee.



50 Sales & Service Offices in Principal Cities

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Making any predictions about what's going to happen to business in the future, regardless of the length of time involved, is evidently not smart. For various reasons, mostly the doubt as to what the Communists will do next, the buying public has been hesitant in spending money. And a further drop in furniture buying was indicated. Strangely enough, the opposite is the case and the retail furniture business is pulling out of its recession. As a result of this, retail buying inventories are cut down materially.

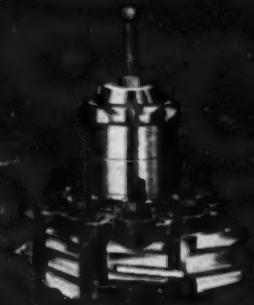
The consumption of veneer is due for an upswing. With a good supply on hand, the manufacturers and jobbers can expect better business not only from furniture manufacturers, but some building and industrial users as well. Remember this time last year when both supply and demand zoomed to an all-time high!

Although home building in number of units has fallen far below last year, it is still doing right well for itself. New homes — and some very fine ones — are springing up in almost every community.

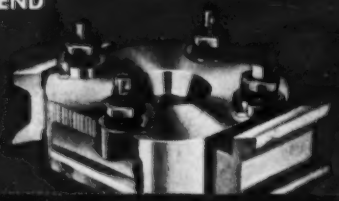
This issue of WOOD WORKING DIGEST pretty well hits the mark, we believe, in carrying a great deal of editorial material aimed to help our readers improve plant operation, cut costs and boost production. Just how important a factor is noise? Have you ever considered it or tried to reduce noise in your plant? Mr. Fair, writing in the Safety Section, has several suggestions.

SASH AND DOOR MANUFACTURERS!

There Are Six Excellent Reasons Why You Should Use YA CUTTERHEADS



DOOR HEAD
CLOSED END



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So whether your sash and door production requires one cutterhead or a complete setup, always specify Yates-American. You'll get best results all around with YA Sash and Door Cutterheads.

MATCHERS

BAND RESAWS

SANDERS

SURFACERS

CIRCULAR RIP SAWS

While we are on the subject of editorial material, if you missed the first chapter of Tom Perry's new series, "Types of Plywood," let us know. We have some extra copies of the first chapter on hand and will be glad to send you one as long as the supply lasts.

How is the labor situation in your plant? Have you done the best with the skilled workers you have? What about older men and the women of your community? They'll still be here long after the young men have marched away. Don't forget the handicapped either, many of whom could be fitted into your business. We know of several firms who feel they have helped a handicap person and helped themselves by employing these individuals. There are jobs and operations in every plant where these people can be used.

Things that you can expect in the near future in WOOD WORKING DIGEST — editorially that is — include an article by the head man of the "Clinic of Wood," Paul Graham.

Something we should all give immediate consideration and act upon if at all possible is being advocated by Charles E. Wilson. The most important part of his suggestion is dual-purpose plants. Plants that can turn out either civilian goods or war production. Check and find out what you can do — and do it now!

Now watch your furniture sales zoom! The use of wood furniture and equipment is being recommended by the Munitions Board — in place of metal. They say, "Whenever feasible, get alternate bids on wood." Are you bidding?

Do you take advantage of the South American market? There is a lot of business "south of the border" if you have the know-how on how to get it and most important, know where credit is good down there. Our Hitchcock Publishing Company has an Export Division and publishes an industrial magazine that effectively covers South America. It is called REVISTA INDUSTRIAL. If you want information about this profitable field write Export Division, Hitchcock Publishing Company, 222 E. Willow Ave., Wheaton, Illinois.

If you don't get it already, you should be receiving one of the best government informational bulletins we know. It is called "U.S. Department of Commerce, Field Service Bulletin of Commerce." Write to get your copy to the Department of Commerce.

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- **1½" blade stroke—50% longer.**

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IS *Bending* of SOLID WOOD Becoming a Lost Art ?

Part 1

BY PAUL H. GRAHAM

SOLID wood bending is the most economical means known of fashioning wood into curved or bent form to provide maximum strength with a minimum volume of wood. While persons who are closely associated with bending seem to know in a vague sort of a way that bending wood also gives it certain additional strength properties, this fact seems to have been overlooked in technical studies of bentwood and is seldom used in promoting more extensive use of the bending process.

The ultimate success of any bending operation is dependent primarily upon six major factors:

1. Selection of wood species best suited to bending.
2. Proper seasoning of bending stock.
3. Proper machining of bending stock.
4. Proper softening, or conditioning to make plastic, of bending stock to render it sufficiently pliable for bending without breakage.
5. Bending with proper devices, equipment and technique to control fiber movements of wood during bending process.
6. Proper drying and setting bends to a moisture content and permanence so they will not change shape while bentwood is being machined before being permanently fastened into place.

The actual bending operation involves bending either on unheated forms or in hot plate presses. Bending on unheated forms may be either a manual or mechanical operation. Hot press bending has used all types of impelling devices which have developed from the long lever, handwheel, steam cylinder hydraulic pressure to compressed air for closing the press Modern hot press installations use either hydraulic or compressed air pressure.

The art of wood bending has been practiced in some form or another for centuries. Old folk tales passed down from early colonial days relate how the American Indian softened wood with steam produced by pouring water on hot rocks surrounding the wood to bend wooden frames for their canoes. Early American chairmakers bent bows for their chairs by boiling the wood in a tank until it was softened, and then bent it about a cask or a barrel with the ends fastened in a stationary position, tied with a tarred string and a stick extended across the bentwood, until it dried and set into the bend required.

The first use of the metal strap to prevent breakage in bending is credited to an Austrian craftsman, by the name of Thonet. A subsequent appreciation of the need for end pressure control led to the addition of end fitting to allow the piece being bent to be put into compression. Other means have been provided for the application of both end

Austrian bentwood rocker. Each side of this rocker is made of one piece from one continuous bend of Austrian beech.

and side pressure and to release this pressure automatically and gradually as bending progresses.

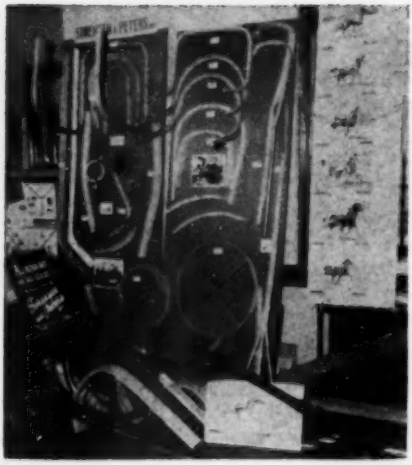
There is not enough definite and accurate information available on the subject of wood bending. The U. S. Forest Products Laboratory at Madison, Wisconsin has done much research and developed considerable information both at the laboratory and in the field, and the Forest Products Research Laboratory at Buckhamshire, England has made a comprehensive study of wood bending. By and large, however, there is far too little reliable information available to the person sincerely interested in learning the finer points of wood bending.

There have been a few articles published in the various trade magazines serving the wood industry, mostly of a technical nature, and technical reports are available from the American and English research laboratories previously mentioned. One of the best publications currently available from the U. S. Forest Products Laboratory is the recently released Report 1764, "Bending Solid Wood To Form," by Edward C. Peck, technologist.

Contrary to popular opinion, there is still much wood bending being done on a commercial scale in woodworking plants all over the country with bending techniques which produce highly satisfactory results when applied by skilled and experienced wood benders who know what they are doing. Unfortunately many of these men are fast approaching the limit of their useful working life and the prospects of replacing them does not seem good at this time.

It is also unfortunate that the experienced wood bender seems to be a charter member of that secretive order of woodworkers who fight to hold on to their trade secrets to protect their jobs. Reliable research groups have issued reports detailing things that cannot be done in wood bending but when visiting woodworking plants all over the country, I find these rules consistently violated with apparently good results—I wonder. In many cases the reason some unorthodox method works is due to the development of some special device or process, known only to one man, or a tightly-knit group, who religiously protect this secret from all comers—including top management.

For example, as a young man prior to World War I, I had the good fortune to be associated with the old Thonet organization in New York. Due to conditions in Europe bentwood parts which were formerly exported from Austria were being bent in the United States. Stock that was to be bent into complex and reverse curves was first conditioned by soaking in a vat just prior to steaming. A magic fluid, kept under lock and key, was used to treat this stock and to the best of my knowledge its formulation was known only to the bending room foreman who had been imported from Austria to supervise bending operations.



Representative bentwood products of a New England commercial bending plant.

Nearly all wood bending authorities are in agreement concerning wood species best adapted to bending. Ring porous woods are generally superior to diffuse porous woods for bending because their porosity provides for the extra wood volume created by the compression of the wood fibers on the inside of the bend. Hardwoods bend better than softwoods as a rule but some hardwoods bend better than others. Wood to be used for severe bends should generally be a long fiber wood, like rock elm, and its cell structure should have a high modulus of elasticity. The bending quality of any wood must be based upon the consideration that the actual process of wood bending involves the compressing of some wood fibers and the expanding of others.

Few wood bending authorities will commit themselves to a definite listing of wood species in the exact order of their bending quality. In a published report of tests of machining and related properties of southern hardwoods on the basis of breakage percentage during uniform bending tests made without end pressure by E. M. Davis, Senior Wood Technologist, U. S. Forest Products Laboratory, wood species tested were rated in the following order: hackberry, white oak, red oak, chestnut oak, magnolia, pecan, black walnut, hickory, beech, elm, willow, ash, sweetgum, soft maple, yellow poplar, hard maple, chestnut, tupelo, cottonwood, black gum, mahogany, sycamore, buckeye and basswood.

The Laboratory Report No. 1764 lists yew as a softwood suited to general bending and the cedars, Douglas-fir, southern yellow pine and redwood for bending to moderate curvature.

The Davis tests indicated that heavy woods generally bent much better than light woods, with woods of a specific gravity of 0.50 and over consistently producing best results and those of 0.40 and lower poorer results. This view seems to be substantiated by the experience of industry Hard maple was a notable exception in the heavy group and willow in the light group.

There is considerable variance within a single wood species as well and bend-

Bow stock is accurately trimmed to proper length to fit the bending straps on a double-end equalizing saw.

ing stock must be carefully selected for straight grain and freedom from such defects as cross and curly grain, knots and brittleness, and doze and decay. A general usage survey shows ash, elm, hickory and pecan seem to be preferred for making severe bends, with rock elm showing a decided commercial preference. Woods generally used for chair and furniture bending include: beech, birch, hickory, maple, sweetgum and walnut. White oak is most popular for bending parts used in boat and ship building and elm, oak and hickory are most used in the wooden wheel industry for fellies.

Although many published reports state there is no evident relation between bending properties and average rate of growth, practical wood benders believe second-growth or fast growth woods are best where bends are severe and in those applications where a master strap cannot be used, as in the bending of wood stirrups. These products are usually processed and bent from green stock, and fast growth elm, hickory and walnut are usually used.

There is also evidence to support the theory that bending properties of wood may be affected by its original position in the tree. A chair manufacturer, who operates his own sawmill, discovered that hickory bending stock cut from logs taken from the lower part of the tree possessed superior bending properties. A retired bicycle maker says that he always specified lower trunk wood for use in making wooden bicycle rims as his experience indicated it to be better suited for bending.

The real secret of the marked success of European bending was due primarily to their careful selection of bending lumber According to one Austrian bending authority, they not only selected their bending lumber but grew timber specifically for bending use. They required that trees from which bending lumber was obtained be sound live trees in their prime. The trees were felled late in the fall and were sawed into lumber the same winter or early the following spring. This practice is claimed to preserve the natural life and elasticity of the wood.

The demands of American high speed production and our inherent impatience with delay will not brook such exact selection and our diminishing lumber supply will not permit ruling out all minor defects. Cross and curly grain, large knots and decay cannot be allowed if good results are to be expected. Slight irregularities of grain and small knots, however, are usually permissible on the convex side of the bend where the metal retaining strap is to be used.

The loss from improperly selected stock in commercial operations is much too great. A survey made at a commercial bending plant showed 75% of the total bending waste was due to poor selection of bending stock, 15% to machining defects, and 10% to actual breakage in bending.

Seasoning or drying of stock before bending is most important. Wood may be bent in either green or air-dried condition but for most commercial purposes air-dried lumber provides the best bending material. Many experiments have been tried with kiln-dried stock but kiln drying seems to impart a brittleness to the wood which affects the bending quality. Bending stock must be seasoned according to good air drying practice. Experience seems to show better seasoning for bending is accomplished under cover in open storage sheds, well stacked on stickers to afford full circulation throughout the stacks.

It is equally important that bending stock be piled to avoid damage from decay, leaving ample space between the bottom of the pile and the ground and piling so that air can easily drop down

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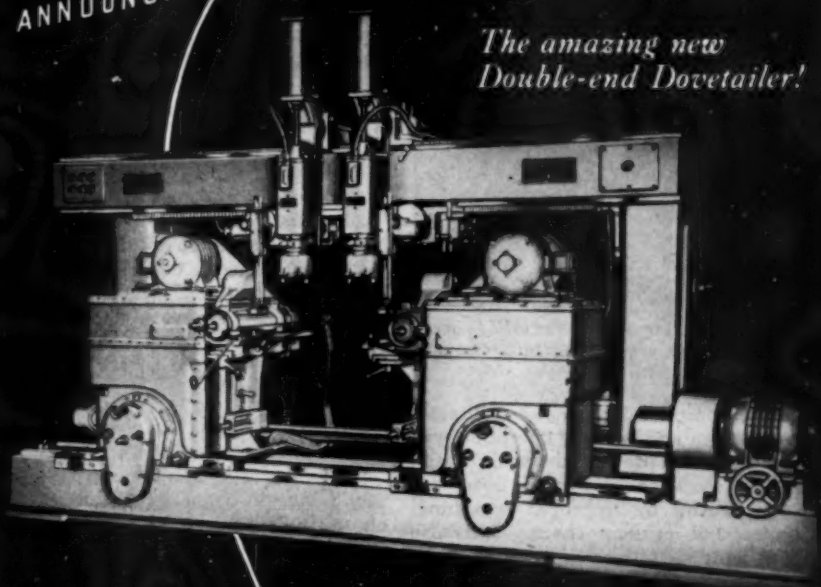

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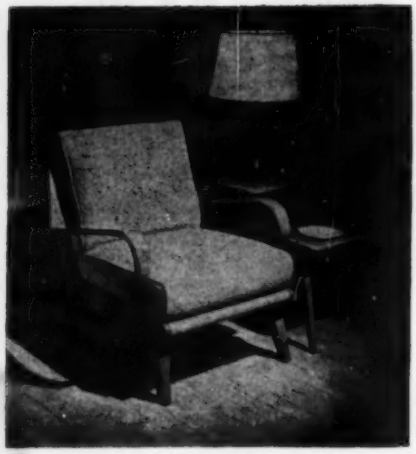

Arms of this Heywood-Wakefield occasional chair are steam bent to permanent shape in one continuous bend.

through the pile. An analysis of breakage waste in any bending operation will show much of the "brash" and "dead" bending stock to be due to doze and decay caused by improper seasoning. Shakes and surface checks will also cause bending failure. If bending stock is cut to length before seasoning, it is also good practice to end coat material to prevent end checking and splitting.

The term "air dry," as applied to bending stock, may denote wood with a moisture content ranging between 15 and 35%, depending upon the bending process to be used. General practice varies also with the softening method to be used so it is difficult to establish any hard and fast rule. Where the stock is to be steamed and/or boiled, a moisture content of 15 to 20% is usually required. If the stock is to be bent in the hot press without conditioning, the moisture content may run as high as 20 to 35%.

Too few plants appreciate the importance of dressing all sides of the bending stock and cutting it to accurate length before bending. Some plants bend stock in lengths cut direct from the rough cut-off saw. Others trim a second time on an accurate equalizing saw, taking care that all pieces for the same part are cut to the same length and the proper length to fit the straps in which they are to be bent. Some plants do not surface bending stock at all before bending, others dress only one face, or the two faces that become the concave and convex surfaces of the bend.

Many plants dress three sides of the stock but do not surface the side that is to remain plain. It is important to dress all four sides, not only to be able to detect defects before bending but also to prevent compression failures or wrinkling at heavy saw marks. One plant with a very good bending performance even goes so far as to sand the inner surface which is to contact the bending form on the inner surface of the bend.

The four-side moulder can be used to advantage in dressing bending stock to four flat surfaces. Some plants mould all detail on bending stock but this is not generally regarded as a good practice. In the case of Windsor chair bows, for example, they are required to be rounded on the back and carry a multiple bead on their face. When these are shaped before bending, much trouble is experienced trying to keep the round back in proper contact with the bending strap, and the deep cut of the beading detail has a tendency to buckle or wrinkle in bending Better results are obtained when these members are shaped after the bow is bent.

Bending stock that has been cut to length at the rough cut-off saw usually has considerable variation in the length of the pieces; some are too short and some are too long for the straps. This condition may be caused by the condition of the saw or cutting gauge, carelessness of the operator, or the practice

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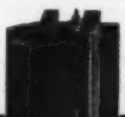

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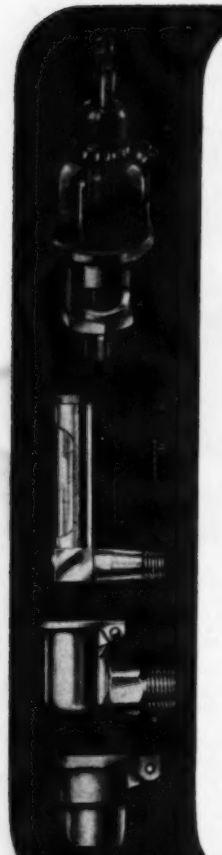

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of cutting too many sticks at one time. Even when an accurate equalizing saw is used and proper care is observed in cutting, trimming bending stock to accurately fit the bending straps presents a number of problems.

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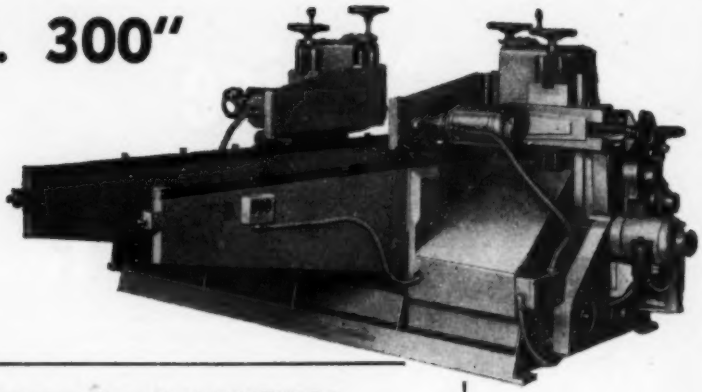

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PROGRESS
Through the Use of Carbides

By Eric T. Rothley

Carbide-tipped woodworking equipment offers the woodworking industry the benefits of increased production at costs lowered because of less down time for sharpening and improved quality of work. Failure of carbides to give immediate satisfaction in some cases can be traced to their installation in defective machines. The profitable extension of the use of carbide should be a joint undertaking of machine tool builders, cutting tool manufacturers, and wood fabricating shops.

TUNGSTEN carbide is in truth a miracle name. It refers to a man-made substance that is next to the diamond on the hardness scale. Tungsten carbide, or just plain "carbide" as it is most commonly referred to, has been known to high production shops for upwards of 25 years. Its use today is extensive in metal working shops, but the woodworking shops as a whole have yet to grasp this means of greater output.

Practically everyone with shop experience has heard or read of Tungsten carbide. In some isolated cases carbides are still erroneously associated with the old gas generated illuminating light. In olden days it was used to "light the way." Today we can use carbide to "light the way to higher output with lower unit costs." But we have a long and dark path to follow before the maximum can be obtained.

Progressive shops have tried carbides on one or more applications with generally good success. The mediocre and small shops have yet to "form the carbide habit" because of poor initial results, refusal on part of employees, outmoded thoughts of management, or because of lack of capital.

Carbides in War Efforts

Carbides and their correct application in the metal trades probably did more to win the last war than any other single production item. This is factual from the many case histories conducted by production engineers, time study and methods departments, and machine tool builders. A single application may be cited to point out the value of carbides in this field.

While the B-29 of war and present fame was still on the drawing board, some shops were engaged in manufacturing parts for it. In a western shop great difficulty was experienced in milling a part for the landing gear assembly. Fifty-eight milling machines working three shifts daily were engaged. The material was so tough, hard to mill, and production so low, that the Air Corps was constantly at management's throat. Production for the three daily shifts on the 58 mills was only 58 parts. To help break this bottleneck, it was decided to take the problem to a

---

Mr. Rothley is vice president of the Big Four Carbide Tool Co., Cincinnati, Ohio. This speech was presented at the 1951 meeting of the Forest Products Research Society and is reprinted with permission.

machine tool builder. After an investigation, some changes in fixtures and jigs were made, milling machines and carbide tipped milling cutters were especially designed and employed. The results were unbelievable. Eight mills so prepared, actually out-produced the original 58. The milled pieces had cleaner finishes and dimensions were more closely held.

The good results of carbide application by the metal trades can be duplicated in the woodworking field if sufficient interest can be aroused by machine tool builders, cutting tool manufacturers, and production shops. Actually it took a world war that placed our very lives in danger to shake the lethargy from the metal trades. When it became obvious that the production of war material would have to be speeded to catch up with the enemy who had had years of war production, a definite turn to carbide was made.

Naturally we do not want another war to shake us out of our lethargy, but some means must be taken so that the advantages of carbide can be successfully enjoyed.

Co-operation for Progress

Aside from the consumer who pays the bill, there are three groups in this industry who can, if interested, work together for the mutual advantages obtained by the successful use of carbides. These groups are the machine tool builders, the cutting tool manufacturers, and the wood fabricating shops. Not one of these, no matter how strong his desire, can accomplish the job by himself. Experience, ingenuity, the pooling of technical knowledge, and application are equally important one to the other. Each factor is so dependent on the other that success can only come by wholehearted co-operation.

You may ask "Why should I get excited about carbides? What will it mean to me? How much is it going to cost? How will I profit?" One statement may be given for all these questions. It follows: One must take advantage of every modern method of production. If he doesn't, his competitors, with their methods, will force him to lower his selling prices, which in turn will reduce his profits. Without a legitimate profit, he will have to close his doors.

The writer is engaged in manufacturing carbide tipped cutting tools, and would like to manufacture just as many as possible. However, if he and his associates were not making carbide tools, they would be making high speed tools, so increasing carbide volume as such is not the objective of this paper. Rather the advantages of carbides to industry, the modernization of shops, and the increase of profits to industry as a whole, have prompted its presentation.

Many of our operations, and in fact the whole production of many shops, remain the same today as when grandfather founded the business. This isn't progress, this is only hanging on. These shops rarely offer competition to anyone. How can such a shop compete with a modern shop? Think of the quality and cost for a moment, if automobiles were made today as in grandfather's day.

To swing the metal trades to carbide, pressure was brought to bear by the production shops. They presented their problems to the machine tool builder. He responded, and in many cases, built special machines. In woodworking, in some instances, this has also been done. The majority of plants, however, have to be sold on a better machine or an improved method. Rarely do you find a shop buying. It seems therefore that perhaps the woodworking machinery builders and the cutting tool manufacturers must take the initiative. They should devote a share of their employees and capital to research. From this will come better machines, better methods, and a modernization, which will be felt industry wise.

Carbides for Glue Line Ripping

For the uninitiated, it may be well to present a few examples of typical carbide productivity in woodworking. It would be safe to say that when steel blades are used for glue joint ripping, only a jointed blade is satisfactory. The length of time this blade will remain sharp is known. Generally a day is a long time, more often it must be removed sooner, depending of course on stock and feed rates used. By contrast, a carbide tipped rip saw blade will last for weeks, months, and some have been known to successfully cut glue joints after 14 months of continuous daily production. Admittedly this is an exception and not the rule. Generally speaking if care is used in putting a blade on the saw, and judgment exercised in feeding, carbides on average stock will go 40 to 60 times over steel. The writer knows of one application where carbide tipped rip saw blades repeatedly produce 280 times more work between grinds than any steel blade previously used. Incidentally on this application, when the steel blades became dull, they cracked. This has not happened with the carbide tipped blades because they were replaced when dulling first became apparent. It might be of interest to know that three men were engaged in this rip operation and with the steel blades a stop was made every 15 minutes for blade change. Think for a moment of the production hours lost when the machine was stopped every fifteen minutes and the three men idle, the sharpening charges consumed, and the faulty snaky cuts made as the steel blade dulled. The volume in dollars and cents in this instance is staggering.

Carbide Trim Saws

The advantages of a carbide tipped saw can be seen quite easily by anyone engaged in making veneered panels or using veneered panels in cabinet work. Ordinarily a salesman must not only sell the front office on carbide tipped tools, but usually must sell also the saw filer or tool room man. Recently a superintendent phoned long distance to ask that a carbide saw salesman call on him the following day. This request was rather strange as the salesman had been calling steadily for months but to no avail. It developed that this particular shop had suddenly become extremely busy, working 100 hours per week making plywood panels for the television cabinet trade.

Due to the hours of production, the steel saws used for trimming the panels to size were becoming dull very quickly. The cuts were rough and chipping was excessive. Often blades had to be removed immediately after being placed on the sizer because of excessive chipping and splintering. As a consequence, each shift was depositing many saws at the feet of the saw filers who had not only the rip saws to file and sharpen, but also the various planer, jointer knives, the trim blades, and all other cutting tools. It was just too much for them. When the salesman talked to the filer in this department, saw blades were actually stacked several feet high awaiting to be filed. It was these men who finally convinced the front office of the need for carbide tipped saws.

This organization is now using carbide rip blades on several saws and carbide trim blades on all their panel sizers. Results are outstanding. As mentioned, the shop is going 100 hours a week. The carbide trim blades go eight to nine weeks before the first sign of chipping on oak or Sonora veneer appears. These woods, as you know, are notorious for chipping. The average life between grinds, on other woods, is ten to twelve weeks. This shop now has approximately $7,000 worth of carbide tipped tools. The front office, the saw filers, production engineers, the customers, and of course the saw salesman are all pleased. The quality of the panels

Diehl straight line ripper. Extended use of carbide-tipped tools in the woodworking field points to continued progress in better products through better equipment and methods.

is better because of straighter cuts and elimination of chipping.

Some Advantages of Carbides

Carbides permit better finishes, have a greater life between sharpenings, and actually do some operations not possible with steel tools. The elimination of subsequent jointings, sandings, handling, etc. makes for great savings annually, to say nothing of higher production rates by steadily operating machines, possible by the elemination of down time resulting in the steady flow of products.

Carbide can be used successfully on 99 percent of all cutting operations. However, the writer does not know of a single plant so equipped. Some shops are eager, but many have tried a tool of this or that type and were not pleased with the results. There must be, and are, good reasons for their dissatisfaction. Let us go deeper into the subject to see if they can be overcome.

We are in a period more or less of reformation. It hasn't been too long since our machinery became motorized. One still sees spindles, originally belt-driven, now converted by motor to a self-contained unit. However, the majority of machines are fairly new. Both types should be equipped with carbide tools. This is difficult due to the old machines, but in the interest of progress, it should be done. In this transition period which actually never ends, competition forces constant changes.

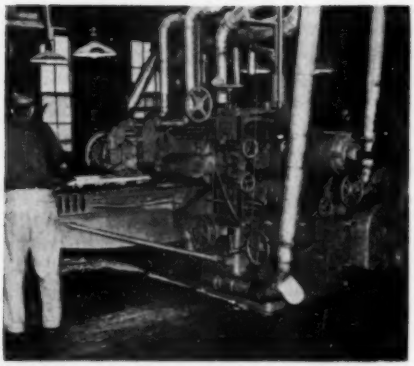
Personal Observations

From his experience, obtained from calling on woodworking shops from coast to coast, and from the Lakes to the Gulf, the writer has arrived at some definite conclusions. The first essential to progress would be an open mind. An open mind to thoughts expressed by those engaged in the industry. This we could probably call education. Education is greatly needed by machine tool builders, tool makers and fabricating plants. Often it is extremely difficult to put an idea across. If you have ever gone to the boss with a new idea you'll know exactly what I mean.

It seems then that this job of educating woodworking shops to the use of carbides must come from the machine tool builders and the cutting tool manufacturers. It is doubtful if the fabricating plant will go to them for new thoughts. However, before one can teach, he must know his subject well. Let us take up the woodworking machine tool builder and see how he fits into the picture.

Machine Manufacturers

There are, of all the woodworking machine tool manufacturers, only a handful who stand head and shoulders above the rest. Their reputation is due to their constant efforts to build superior machinery. They can well be called progressive. However, in many other cases the machinery builder is making the same machines today, keeping the same dimensional tolerances, using the same materials, and employing the same methods of production as



Greenlee double end tenoner, another illustration of carbide-tipped woodworking equipment.

he did in the 20's. This manufacturer has no research department, probably has no engineer—for with his product he needs none, and probably no detail or assembly drawings. His employees have been making this same machine for such a long time without any improvement or change, that they know the dimensions by heart. If a part doesn't fit, then the assembler just makes it fit.

This criticism may seem harsh. It is no doubt, but progress cannot be made without just criticism or without the pressure of competition. These manufacturers must clean house and open their minds. They must build the finest machines possible, they must place their ingenuity to work making the finest quality castings, which are heavy, rugged, and machined to thousandths of an inch and not to fractional dimensions. The metal machine tool builders were confronted with the same situation. They faced the challenge and conquered it by newly designed, more rugged, and heavier machine tools. All this just for the use of carbides which offered more and better production. Where formerly a casting had two internal ribs, there are now five. Ways are planed, ground, spotted and then flame hardened. Some even have ways of hardened alloy inserts. Lubrication to all parts is now pressurized. Bearings, whether ball, taper, or roller, are all matched precision bearings. The finished tool costs more than formerly but this machine is capable of precision work and more of it, than previous models.

Many woodworking shops would like to use carbides and have actually tried them, but results were not to their liking, often due to poorly designed or poorly constructed machines. In these instances it is usually customary for the tool salesman to try several saw blades, or cutters in his efforts to make carbides work. Many times on new machines, which for some reason will not take carbide, a salesman, or salesmen from several competing companies will try many blades before one will produce a glue joint. Recently in a plant in North Carolina, a superintendent stated that four saw companies had sent men and blades in for use on his new rip saw. These four men tried 10 blades before one was found to produce a glue joint. Yet these 10 blades all produced good results on other machines. It was finally agreed that this particular machine had a specific vibration, and only after a blade of the same temperament had been found, did it operate as it should. Attention should be given to vibration dampeners as most metal machine tools now have.

Flanges

Flanges, arbor assemblies, and arbor bearings offer another touchy problem that should, and some day will be properly controlled. Many flanges and arbors on machines in the field have been checked with machinist's indicators. Runout is sometimes pitiful, while play of thrust bearings is exorbitant. Both flanges of an arbor should have not more than .001 runout, less would be better. I have faced many flanges in the field to less than .001 and I have succeeded in making carbide blades

perform successfully. The arbor flange should always be ground while in position on the arbor. Generally this is not done, as the flange is only turned and then placed on the arbor with no further attention. I know that these points have been brought up many times before, but there are still those who believe there is no good reason to build precision into a saw as the stock will usually be jointed anyway. These fellows with their "good enough" ideas some day will see the light of Progress.

Jointed Swedge Tool Blades

Have you ever wondered why a jointed swedge tooth blade produced smooth sawed surfaces and a good carbide blade could not on the same saw? The operator, when jointing the blade in position on the arbor actually grinds off the sides of the teeth to make them track exactly. This reduces teeth to correct width and also corrects for any flange runout on that particular machine. He then has a good blade for that machine, but it dulls quickly because he has ground off his clearances. Further, that blade cannot be put on any other machine and be expected to produce good glue joints. It has been prepared for one machine and no other. A carbide tipped blade could not be put on such a machine and be expected to produce good work because the flange runout would produce such a high tooth condition on the work as to render the work unusable without further operations. Carbide blades cannot be successfully jointed in position. For smooth finishes they must be put on machines in top condition. Machine tool builders should also give serious thought and research to building machines with variable rpm. Some day we will be machining each species of wood much as we machine different types of metal. This is accomplished by variable speeds and feeds.

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The points brought out above are responsibilities of the machine tool builders. For the most part they are doing a grand job, but some still close their thoughts to perfecting their machines to take carbides. Some manufacturers are still resisting this progressive movement and openly advise they do not recommend carbides and want no part of them. We could not call these manufacturers open minded.

Responsibility of the Cutting Tool Manufacturers

The finger of criticism next points to the cutting tool manufacturer. He, too, is charged with a grave responsibility, and should be made to do penance for a long time for his methods in introducing carbides to the fabricators. In many cases carbides were over-sold to the customer. He was told that carbides would last forever and that his troubles would vanish. They were represented as a cure-all. In other cases the carbide tool salesman was an order taker and had no knowledge of the product. By quick talking he had permission to write an order. When the tool arrived, it was placed in production without one word of advice or caution. The result usually was a badly chipped tool, damaged in placing it on the machine. The cuts were faulty due to lack of proper rpm. or to foreign material between tool and flange, or to sloppy fits. If a tool did perform satisfactorily, it was allowed to run too long, causing excessive wear to tips and necessitating a large repair bill. When a tool failed to work successfully, the customer registered a complaint. This, in most cases, was ignored by the tool manufacturer. He flatly stated that the tool was in good condition when it left his shop, and if it didn't work properly, it was certainly the fault of the operator. This produced bad feelings, as the customer had purchased a tool in good faith and it had failed to

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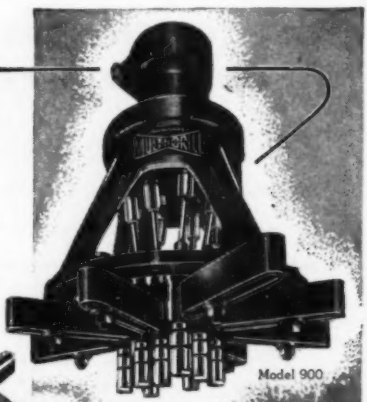

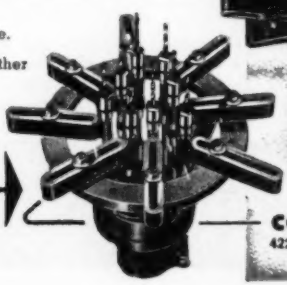

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give him the desired results. He either wanted a refund or satisfaction, but got neither, and consequently developed the feeling that all manufacturers were out to get him.

The cost of carbide tools is another stumbling block. Plants are not eager to spend hundreds of their scant dollars for a possible money saver.

Recommendations for Tool Manufacturers

The cutting tool manufacturer should only offer thoroughly tried and tested tools for sale, and then only for use by skilled personnel on machines in good condition. His salesmen should be thoroughly trained in the subject so they can be of real service to the woodworkers should trouble develop, and offer constructive advice. The salesman and the tool manufacturer should be truthful and they should refrain from buck passing. Tool manufacturers should develop newly designed tools. In many cases the same tools used in the old days are tipped with carbide, but carbides demand specially engineered cutter bodies. Justifiable complaints should be quickly and pleasantly handled for mutual good feeling. And lastly, the tool maker must seek ways to lower his costs so that carbide tipped tools can be available to every shop for every operation. Carbide costs are high and in many cases out of reach. A reduction in price, with quality maintained, would permit widespread use and real progress would be made. It would also force machine tool manufacturers to build machines capable of carbide usage.

Fabricating Shop

The last, but most important of the three interested groups is the wood fabricator. Many are really progressive, but the majority go along from day to day in the same manner as they did years ago. These fellows need education.

MOISTURE REGISTER

● A fast and easy way to test the moisture content of lumber or veneer. The RF4 type shown is used to test finished or rough lumber. We also carry the V2 type for veneer testing. No needles—finished pieces may be tested without marring the surface. The instrument tests accurately as low as 0 moisture content. Portable, fast and accurate, it is guaranteed for one year and comes complete with fabrikoid carrying case.

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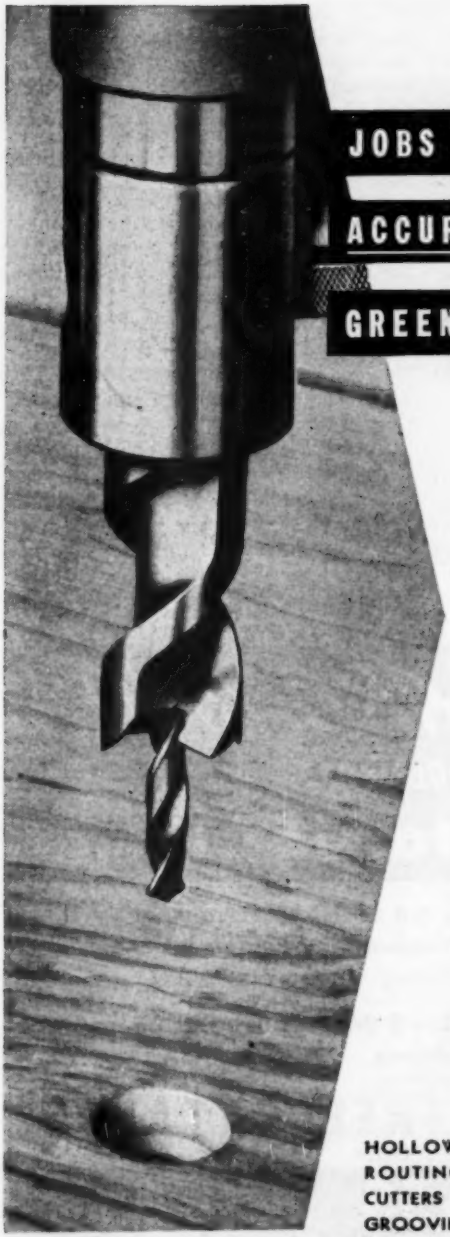

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Ask for free *Boring Chart for Wood Screws . . . simplifies tool selection*

TOOLS FOR CRAFTSMEN

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ROUTING BITS • MULTI-SPUR BITS • PLUG CUTTERS • COUNTERSINKS • MAKERS OF TECO GROOVING TOOLS FOR TIMBER CONSTRUCTION

Their minds are closed. They are reluctant to take advice or to make changes that cost money. Usually the initial outlay is all they consider. This barrier to progress is gradually being diminished, as sons of owners are now coming from the universities where they have seen the advantages of modernization, and usually won't rest until changes are made in their plants. Many shops are sending key men to educational meetings where new methods are discussed. This helps progress as it creates a desire in the minds of these key men who will try to duplicate these improvements.

Any and all progress costs money. He who profits most should pay the most. Often, tool or machinery builders are asked to design or even build a special item at considerable expense. The customer will approach them with the proposition that if it works he will buy. This is too much to ask. The fabricator must be willing to spend his own money for improvement. This is so much in contrast to the ways of the metal workers. They, when a new idea or method is brought up, commission someone to build it. They realize, from experience, that it cannot be had any other way.

Most woodworkers do not employ engineers. This position is usually filled by the tool and machine manufacturer. This spirit of helpfulness is granted willingly, but it has its bad points, especially in the matter of designing cutters for a given pattern or shape. The knife and cutter head people will tell you of the number of re-works on a no-charge basis they make in a year. This could be eliminated if all data were incorporated in blueprints, but in the woodworking industry most tools have not been made to prints, but to shapes and designs. With this method trouble develops.

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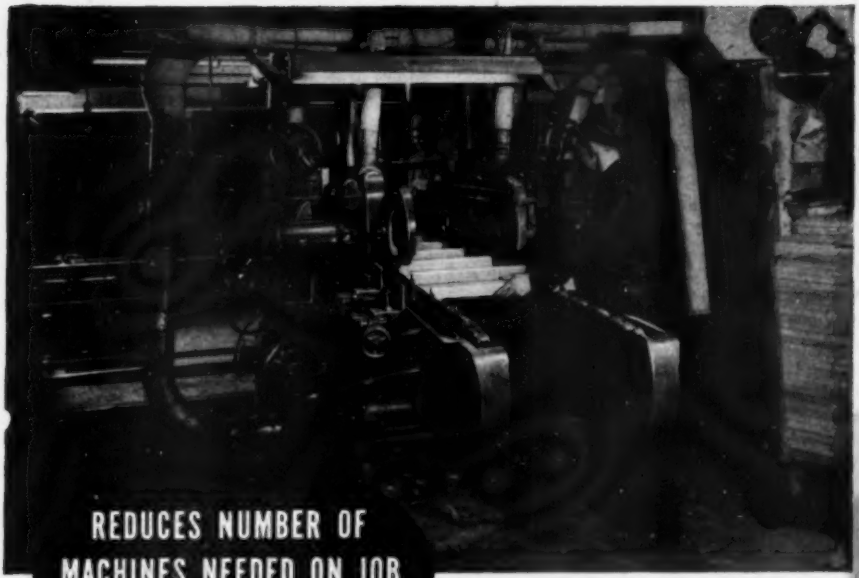

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Maintenance of Machinery and Tools

Education in machine and tool maintenance is also vitally important. There may be many, but to my knowledge, there are only a few shops employing full time maintenance crews. It is their duty to check every checkable point and repair every machine every thirty days. Not only does this eliminate costly repairs and down time, but it also keeps a machine in proper condition for carbide or other application. Machine tools must be in good order for carbide use. Good order means proper rpm, true running arbors and flanges, correctly operating feed chains, end play in spindles down to a minimum, and all working parts closely fitted and properly lubricated.

The woodworker should also charge someone with the responsibility of frequent attention to his carbide-tipped tools. He should handle the tools with extreme care when putting on the machine. He should know that bumps, nicks or other foreign material between tools and collars make for an inaccurate assembly with resultant poor finishes. He should know when to remove a tool for sharpening. The fact that a tool is still producing satisfactorily is no proof that it is not dull. More tools are prematurely worn out by over running than by any other means. A predetermined grinding date should be established for every tool. This permits the potential life built into the tool to be used. Ordinarily a tool is so badly used from long operation after initial dulling that much carbide is wasted when ground. Often it is necessary to remove as much carbide in grinding out nicks as would ordinarily be removed in four or five or more normal regrinds.

Enough for the criticism. Things have been said that might have hurt. They were not meant to hurt, however, but rather were offered for the good of the

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industry. You will note that remarks of critical nature were not directed to any one group, but rather to the three groups controlling progress. The remarks were made in a spirit of friendliness and totally without malice and the writer sincerely hopes that they will be taken in the same spirit in which they were given.

The writer and his associates have a house to clean and, believe me, we're cleaning now and are going to clean until our house is in perfect order. Progress can only be made at an expense in one form or another. You would undoubtedly prefer to make progress voluntarily rather than to be forced into a change by competition. It costs no more to progress with carbides than with other means, and from past personal experiences in the metal trades and in the woodworking industry, more profits can come from carbides than from any other single item.

The End

RED CEDAR

"Where to Use Western Red Cedar Lumber," a new 16-page species book, has just been published by the West Coast Lumbermen's Association. Many uses of this wood, noted for its durability and beauty, are described in detail. Included is a grade use guide for the more generally used items.

BROCHURE ON BITS

A new bulletin descriptive of the complete line of Midway auger bits has just been issued by the Midway Tool Co., Inc., Melvin, Ohio.

The bulletin describes Midway Mirbrite (mirror bright) bits for hand brace which are available in 17 sizes (4/16" to 24/16"). Also listed are 5-6 and 13 piece sets packed in sturdy cases.

Other Midway products described are electric drill bits, screw driver bits, electricians' bits, car bits, and ship augers.

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Have You Tried TIMESTUDY?

Part 2

By H. H. Connelly

ANALYSIS of the job, in a broad sense, means a careful study of all the requirements of the job: grade, material, tools, method of procedure, working conditions, and subsequent and proceeding operations. This, plus a practical knowledge of the proper tools, and how to handle them on the part of the timestudy engineer cannot be exaggerated. A few months actually operating a cut-off saw, rip saw, planer, moulder, matcher or boring machine will be worth more to a man training for the job of timestudy in a woodworking plant than a year in college.

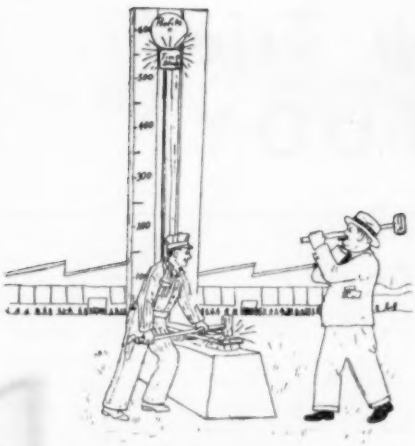
He is then in a position to pass judgement, when later studying the operations, for a fair rate; even take hold of the machine and demonstrate improvements his job analysis has shown to be better.

Good rate setting in the woodworking plant is not a puzzle that can be shrugged off lightly. It is weighed with problems the metal trades never dreamed existed, and is probably one of the major factors that discourages its use by many plants today. Consider the timestudy engineer of a metal working plant. He can make a study over a period of several hours, sometimes minutes, and set a rate that will run consistently day in and day out. The only variable, substantially affecting his rate, will be the energy of the operator. If the operator is the sly type and craves to hold out, on the little woman for a party with the boys Saturday night, he may work at a level in excess of a normal human being. On the other hand, he may be so worn out Monday his production looks like the stock market in '32.

But outside of these (not so hypothetical) cases the machine will run at the same speed, the castings will be the same malleable iron, and the same size, temperature, and hardness—all spelling consistency.

On the other hand, pity the poor timestudy engineer in a furniture factory who tries to set a rate for a ripping operation. While he is making the study, the operator is running No. 2B oak. He sets the rate on good parts after an hour's study and walks away satisfied. But wait! All the next week No. 1 oak is ripped, and the good parts produced for the same sawing time go as wildly out of line as a country boy at a carnival side show.

Maybe you're thinking: all this can be easily solved by separate rates for each specie and grade. No. This flushes another obstacle out of hiding. The more rates, the more care we must take in timekeeping; also the greater chance of error if we allow the men to record their own time and production. Soon if we set rates on each specie and grade that can be used in a part, our clerical system will become so burdensome we



will wonder how the workers get around the clerks.

There is only one satisfactory answer for the confused timestudy engineer. (1) The rates must be kept simple, one rate to cover everything possible, (2) the study must be made over a long period of time for averaging grades and conditions, and (3) production must be paid on a weekly basis instead of a daily output.

The third item is of utmost importance to the woodworking plant for the simple reason it answers to a limited extent the problem of the raw material variable. Rates will fluctuate less from a better sampling of all lumber grades when made over a five day period than when based on one day's run. This also simplifies timekeeping. It takes two days to run out a batch of chair rails, the time by operation is sent in daily, but the quantity need not be counted until scaled to the next operation at the end of the run.

Under analysis, the timestudy man continually tries to effect savings by the elimination of dispensable elements of the operation through the application of specially designed fixtures. For a smattering idea of the unlimited fertile ground the average woodworking technician has: a furniture plant was shaping table tops on an automatic shaper, one form, one part. His production was 120 per hour. After carefully analyzing the job, a new form was built with four stations, each station holding two parts. The new form shaped one half of each table and advanced to a second station on the form for shaping the second half. Results? Production was hiked to 240 parts per hour—same machine speed, same operator, but an improved fixture.

Often a job analyst will show that the operator has enough waiting time while operating a machine to produce twice the volume. But in order to do so, something is needed, a jig or mechanical change. In one plant an operator was box planing tapered legs for a night stand. Actually, after filling the boxes, he had time to shoot a game of pool before the helper could get the empty boxes back A simple gravity feed conveyor was built of curved sections and run from the out end of the machine to the feeding end. As soon as the box was emptied, it was rolled around the machine and back to the operator. By this simple arrangement production was doubled.

Quite often, timestudy analysis will show that an operator has enough idle time to tend two machines by the simple addition of a hopper, or holding device. In one plant, one operator was used to rout cutouts in a table for a fixture, and a second was employed to bore companion holes for fitting. One man was eliminated by fitting the router with an automatic air feeding device with a template, for guiding the work. Consequently, when the machine was once loaded and started the operator was free to move to the boring machine and perform this operation in time to return, unload, and reload for the next cycle.

Job analysis such as described above, showing the most efficient method of procedure for getting a job done, is worth every penny invested—even if the data is not used for incentive payment of wages.

Rates That Control Waste

A good incentive system, well designed for the woodworking plant, does more than consider production. In the final analysis of employee—employer benefits to be gained from piece work, we must first find a measuring stick that is of equal benefit to both. In short, if the workman has in mind only quantity, it is quite human to expect him to ignore the other factors. True, management is responsible—it has placed the greatest emphasis on quantity and ignored the other factors in production by using a quota in pieces as the yardstick for determining a workman's earnings.

The other factor management is concerned with in the woodworking plant is waste. In many furniture plants a drop or increase of 2% or 3%, can mean the difference between black or red ink. Waste control is imperative; and the best control is one where the workman has an incentive to save. This will continue to be so, until such time when science comes up with a super-duper job into which we can throw the offal, slivers, shorts, and miscut mahogany, oak, and other woods, and confidently expect to snatch a board from the out end that has the cells satisfactorily assembled into a passable product, with all the pleasing grain and structural strength as the original. Right now we are safe in concentrating on the human element.

As a result of this, we will find that incentive rates that are tied with waste control do the most good and are practical on those operations where the highest waste losses occur in material, namely the first operations of cutting, either lumber or veneer.

As a simple illustration, let's consider the important operation of swing sawing boards to length. Since this is the first step in reducing the raw material to a piece of furniture, the operator has a grave responsibility for saving the company money. Suppose for the sake of simplicity, we are cutting the rough lumber into 36" lengths for a Queen Anne chest of drawers at 200 boards per hour. The workman's primary interest will be to take home a bigger check Friday to make a payment on the little woman's washing machine. Can we blame him if he slashes out three hundred per hour? In doing so, he will necessarily cut the time required to thoroughly examine the board to cut where the most material can be saved.

Consequently, by the end of the week he has made a nice earning above standard, but the company has taken a beating in wasted material that cost many times the workman's earnings.

By determining the value of each percent of waste material to the company, a graduated factor can be worked out whereby each man, who has anything to do with saving the material, can benefit. Usually the employees are given half of this saved value and the company takes half. The second objective is to determine a standard waste figure which the plant **should** be maintaining for this operation. Detailed analysis and checks over a long period will give a reliable standard.

To apply this formula to the cut-off saw, we would have to set-up a pot, where a crew is involved, and portion the employees saving on the basis of hours worked. If the crew's waste factor saved below this standard for a week was 2% and the total value of 2% of the lumber cut for the crew amounted to $240, one-half of this, $120, would be divided among the crew.

There is one error that can creep into such a rate unless the standard is not carefully set. The waste factor

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must be determined for each grade and specie. Quite obviously if it were set on No. 2 oak and the crew should cut No. 1 for a week, the waste would knock a hole in the records, and through no effort of the employees.

The same control rates can be applied to the veneer cutting crew. In a veneer operation there is one other factor beside yield that sticks its nose into the profit and loss sheets too often for comfort. That is the whole size of veneer that can carelessly be produced in fractional pieces if extra precautions aren't taken by management to guard against their occurence through disinterested workmen. Quite obviously, it costs money to tape or splice fractional pieces into the size order. Therefore, any percent this whole size factor can be increased at the cutting operation, is money in the bank.

There are two major places in the veneer cutting operations where a rate, combining all three factors—yield, production, and whole size—can be used successfully. These are the lathe and the clippers.

To establish such a rate, studies must be made for each thickness to determine the standard yield of veneer in surface feet per thousand feet of logs. The percent whole size that can be expected from each thickness must be ascertained in the same manner. Then, with the three standards determined, it is up to management to say just how much influence each should have on the operator's earnings. In short, how much control does he have over each?

In one plant, it is the opinion the operator has the most control over production. Therefore, the rate was set so half of an operator's earnings could be fixed by production. Since he had less control over whole size, because here the quality of logs entered the picture, twenty-five percent of his earnings were determined by whole

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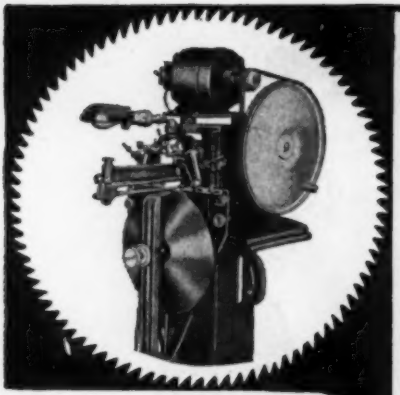

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size and the same reasoning applied to yield.

With such a rate the operator was keenly conscious of each piece of good wood thrown to the hog and flinched each time he cut a fractional size when it could just as easily have been whole size.

Formulas and Graphs Work

Our interest here is not to explain how to work out short methods for establishing fair rates but to point out the ease of its application in the woodworking industy.

Formulas and graphs have been used in setting rates in the metal industry, successfully, since the perfection of timestudy; and are just as adaptable to the woodworking field. It not only shortens the time necesssary to get a piece rate into effect on a new part, but in most cases, sets the most fair and comparable rate on related parts.

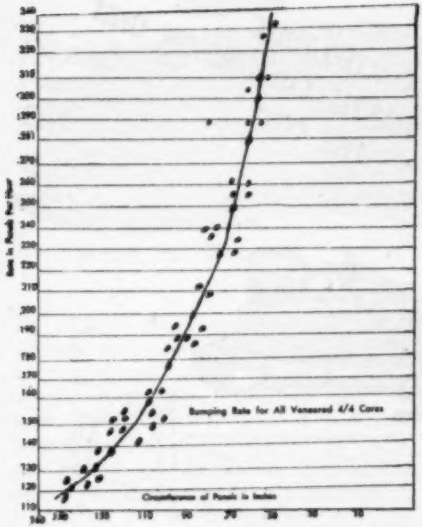
Here as in studying any rate, the preliminary analysis must be made and all the data collected over a wide range of variables, taking into account such important functions as handling, grade, similarity of construction, and machine speed.

Once this has been completed, graphs can be made from the data. You then have in the office, the means of setting a rate on a new part, for the same operations, as soon as it is introduced to production, without sticking your nose into the factory.

Such a simple graph has been made for setting rates on a bumping operation, the trimming off of the surplus veneer overhanging the edges of a solid lumber core, after veneering.

All information for making such a curve was compiled by standard timestudy methods over a wide sample of stock. The result of each study is designated by a separate dot on the graph, and the curve falls along a line of average of all the studies.

Once the line has been established,



future rates can be made by taking the circumference and reading across until the curve is cut. This will give the rate of bumping in panels per hour.

The End

NEW SAFETY BLADE FOR PORTABLE SAWS

Ever since the PTI circular saw safety blade was first announced — there has been a pressing demand for a similar safety blade adaptable for use on portable saws. One of the difficulties that presented itself was the great variation in bores among the leading portable saws. Now PTI, Incorporated, of New York announces a special portable saw safety blade with a new universal bore that fits all standard portable saws without bushings or adapters. This new PTI blade offers the user of portable saws the same remarkable advantages as stationary saws — better and quicker cutting—lower power requirements—and complete safety from dangerous "kick-backs". The new blades are now available in all sizes from 6" up. The 5" size will also be available soon.

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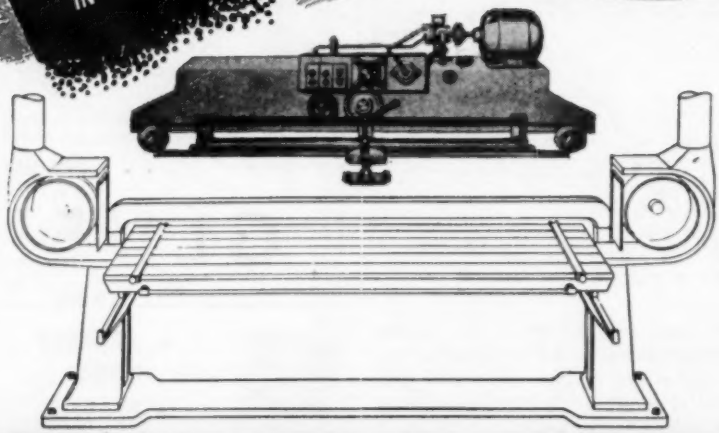

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Down to Earth

WOOD PRESERVATION

By Joseph M. Bray

IN YEARS long past labor was inexpensive and wood of many useful, durable types was readily available. Metals were not so widely used as they are now. Then, as now, wood deteriorated under the ravaging attacks of decay and insects, but costs were not such as to force much interest in prolonging the useful life of wood structures. Today things are vastly different. The artificial inflation, the increasing shortage and higher cost of good timber and naturally durable woods, and the prohibitive labor cost for replacement work have led to a growing public consciousness of the necessity for and advantages of wood preservation. For decades the ardent conservationists, to whom we owe so much, cried that we were wasting our forest resources (and with them the even more basic and necessary resources of water and soil), but these far-sighted individuals were for the most part scorned. The shameful gutting of our forests continued, and wasteful and dangerous utilization practices were used. Today, under the impact of reduced basic resources and the fantastic requirements of our embattled, growing nation, technology is needed as never before. Forestry and utilization practices have improved, but we have a long way to go. We must heed the dictates of need, logic and common sense or suffer the just fate of all greedy, thoughtless peoples.

Good conservation practices, thank goodness, are becoming more and more general. Federal, state and private organizations have been doing well, but all need our help in breaking down that inexplicable suspicion of those seemingly offering "something for nothing." One phase of conservation, efficient wood utilization, has forged ahead admirably, but a firm foundation for the future has scarcely been laid. A very important part of wood utilization is the field of wood preservation. Here also progress has been made. Much has been written on the subject, but only recently has the general public paid much attention. Preservation is conservation. For every piece of wood whose life is prolonged, some tree in the forest can stand longer to grow larger and increase our wood reserve.

All of us are familiar with wood decay around steps, porches and sills in our homes, on stakes in our gardens, and trellises and fence posts in our yards. The farmer knows what a problem decay has become in his maintenance of sound fencing and farm buildings. Each year in the United States, the railroads place tens of millions of preservatively treated cross ties and the utility companies use ten of thousands of treated poles. A long list of other treated timber users could be given. The ravages of decay have been made more acute by the often careless building practices used in recent years (lack of proper seasoning, poor design, etc.), so much demand for treated housing lumber is being created.

Osmose-treating guard posts for the Pennsylvania Department of Highways.

When man first was forced to think of prolonging the life of wood, he naturally was driven to the use of those wood species that possess high natural decay resistance. Good examples of this were the use of chestnut, cedar, walnut and locust. The blight destroyed the majestic chestnut forests in the East, and walnut and locust have become less abundant and more costly. Cedar is still in fairly good supply, but is being used up rapidly. It is also true that present-day representatives of these species are not normally as durable as was the case in the past. This is easily understandable when we take into account the fact that most of these woods used today are fast-growth and sapwood-rich, whereas in past years the trees were slow-growth and heartwood-rich. Heartwood is usually more resistant to decay than sapwood after a tree has been felled.

Thus we are faced with the fact that the need for long-life wood is tremendous, and yet the supply of naturally durable woods is limited. We must make use of what wood species we possess in abundance and make them durable by some treating process. Huge quantities of pine, oak, fir and other species are treated, and research is adding to the number of species usable for treatment.

There are two general classes of wood preservatives in use today, the oil-borne and the water-borne groups. Each has advantages for certain uses. The water-borne or salts preservatives have special advantages where cleanliness in handling, paintability, and decreased fire hazard are important considerations. Certain of the salts preservatives were originally found to be less suitable for use in wet locations because water tended to leach them. Continuous research, however, has done much to eliminate these difficulties.

There are several common methods of applying preservatives to wood. The one we hear most about is the pressure method, making use of forced mechanical pressure to inject the preservative. In this method the wood charge is enclosed in an airtight steel cylinder and there subjected to various combinations of steaming and vacuum prior to mechanically forcing the preservative into the wood. The method is effective only

An example of the importance of treating wood railings. This rail has been in service less than five years.

Looking into the stacking yard at a mechanized plant. Almost all timber treated here is for use in coal mines.

on seasoned wood, so thorough seasoning is a necessary preliminary.

Another method is called the open tank hot-and-cold process. The wood charge is immersed for a time in a hot bath of either water or the preservative, followed by immersion in a cold bath of the preservative. To be effective, this method should be used only on seasoned wood.

Both the forced-mechanical-pressure and open tank hot-and-cold methods are much more easily applied to certain wood species than to others. Difficulty is often encountered in attempting to effectively treat such woods as spruce, Douglas fir, white oak, and hickory. The softer woods and red oak treat readily by these methods. Forced mechanical pressure often reduces the strength of the wood treated. Certain woods (like black gum, for instance) become badly infected by decay while seasoning, so do not lend themselves readily to treatment by these methods.

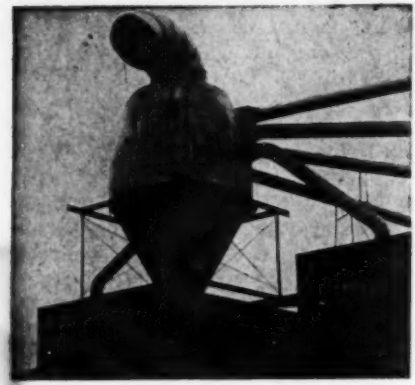
We hear more and more about the brush and dip applications of the oil-borne preservatives. In such cases penetration into the wood is very limited. Such applications have a place in certain operations, but the public must be on guard against those who sell such material as "treated wood." It cannot be compared to the penetrating treatments, and should be called "processed wood." Such brush applications are to be used on thoroughly seasoned woods only.

The ultimate in a wood-preservation process would be a method that gives effective penetration, and thus protection against decay and insects, and yet is simple and inexpensive, does not require a costly and complex plant, is applicable to all wood species alike, and to freshly cut wood (so seasoning is unnecessary), and can lend itself to decentralized operations to save on unnecessary handling and shipping costs. These last points are important because the high costs involved in sending wood to a central forced-mechanical-pressure or a hot-and-cold plant for custom treatment, or purchasing treated material from such plants, has caused many a potential user to utilize untreated wood where treated material was really a necessity.

As one answer to the need for an inexpensive, simple, effective preserving method applicable to green wood of all species, without elaborate and costly equipment and on a decentralized basis, there came out of Germany several decades ago an ingenious development

Pine logs used in this cabin have been treated to give longer life.

Efficient dust collection uncovers buried profits



Large cyclone collector is part of Dixie installation at Ox Fiber Brush Co., at Frederick, Maryland

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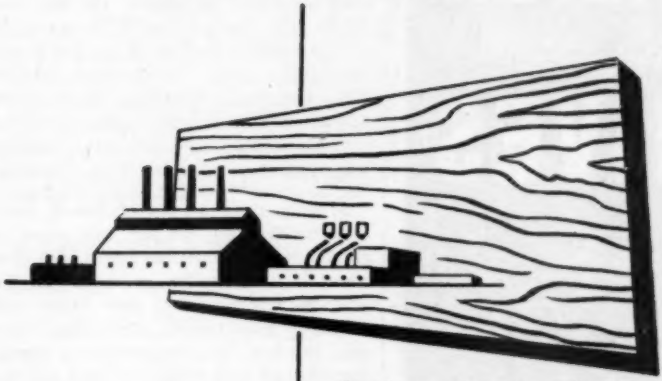
known as the "Osmose" process. The name is derived from the fact that the natural chemical force of osmosis is used to secure deep penetration of the (salts) preservative into the wood. Dr. Schmittutz wanted something that could be applied to green wood, to the abundant spruce of Germany on which mechanical pressure methods had not been so satisfactory as desirable, and (as one variation) to wood already in use (such as the groundline zones of standing utility poles). Versatility in application methods and diversity of uses were important considerations.

Osmosis is a natural phenomenon characterized by a pressure set up between two chemical media of different concentrations and separated by a semipermeable membrane, which pressure causes migration of the chemical components through the membrane until concentration equilibrium is attained. The Osmose process sets up tremendous osmotic pressure by placing a thin coating of a water mixture of "Osmosalts" on the outer surface of freshly-cut green or thoroughly water-soaked wood. The coating of water-Osmosalts mixture (visible particles of the preservative salts are present) represents the concentrated medium, the moisture in the wood, the dilute medium, and the wood cells the separating membrane, forming a natural pressure system. The resulting osmotic pressure drives the preservative deep into the wood (remarkable heartwood penetration is often attained).

"Osmosalts" is a fluoride-phenol-chromate-arsenate mixture and is applied to wood as a water suspension, by brush, spray or dip. A simple vat, or even a bucket and brush, can be used. A very important requirement of the treating procedure is the dead-piling of the processed timber under cover for 30 days after the preservative is applied. This prevents seasoning of the wood

SYNTHETIC RESINS



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and keeps the weather elements from washing the salts off the wood before osmosis carries them in. During the stacking period the salts diffuse inward, and reactions take place under the reducing influence of the wood fibres that tend to lock a large portion of the salts in the wood in the form of insoluble, toxic "chromium cryolite." The retention specified ranges from 0.25# to 0.30# (dry salts) per cubic foot. Concentrations of treating mixtures are regulated by using hydrometers.

Many millions of board feet of Osmose-treated timber are used annually throughout the world. The treatment is used in the mine timber field, and is widely used for fence posts, highway guard posts, structural timbers and lumber. The treatment is clean to handle and fire retardant, and the wood is very strong, very resistant to termites and the lyctus (powder post) beetle, odorless and paintable (yet does not necessarily require painting).

Large quantities of Osmose-treated lumber are used by the wet-process industries in construction of their buildings. An interesting variation of the treatment is a special process developed for application to the groundline zones of standing utility poles.

The research staff of the Osmose Wood Preserving Company is constantly working on special problems related to wood preservation for special needs. The company has developed a non-pressure retort process that permits treatment of green and seasoned wood and eliminates the stacking period for the processed timber. In order to control the application of the treatment in the field, a trained force of experts has been set up to perform the task of making thorough periodic inspections of all treating plants (which operate under license). This is to protect the user and the reputation of the Osmose company.

The End

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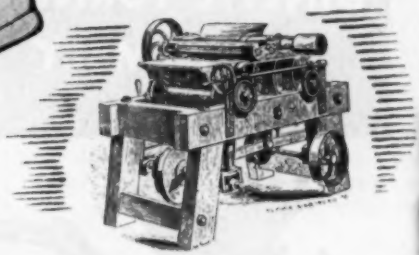
With the close of 1951—the Goodspeed Machine Company marks a full century span of alert progress in the development and manufacture of woodworking machinery. Goodspeed's line of woodworking machinery originated in 1851, when George N. Goodspeed and Mr. Wyman began the manufacture of planers, (see below) dowel machines, pail and tub machines, sawing and boring machines, chair manufacturing machinery, spool and bobbin machines and back knife gauge lathes. With this background—maintaining a constant awareness of new avenues of efficient and profitable manufacture—the Goodspeed Machine Company confidently presents today's modern line of machinery.

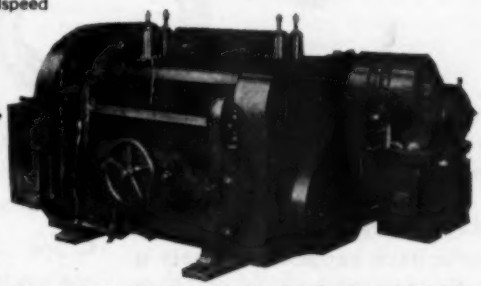
YESTERDAY . . .

planers like the one illustrated at the right were manufactured by Goodspeed and Wyman. Many of the planers made as long as 65 years ago are still in use . . . a tribute to the engineering skill, trained personnel and production techniques of the organization. The same principles prevail today at Goodspeed Machine Company.



TODAY

Goodspeed planers have kept pace with progress and a modern Double Surface Cabinet Planer looks like the illustration at the right. It is this type of progressive leadership which has made customers for Goodspeed . . . customers whose satisfaction is evidenced by repeat orders through the years. As a user of woodworking machinery, you can be sure Goodspeed will continue to build quality equipment—always in stride with the most productive modern technological advancements in the industry.



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Know your wood

CEDAR

BY NED BAILEY

THERE are several types of cedar from which a wide variety of wood and other products are made. The ability of the various specie to grow under widely divergent conditions has developed, in this country and Canada, names that give the general geographical location and often some outstanding physical characteristic.

Western redcedar, with a range on the Pacific Coast from Alaska to California, is the most numerous and probably one of our largest species. There is an estimated board foot stand of 33,500,000,000 of saw timber. Next is the California incensecedar, an appropriate name you'll agree, if you know the tree at all. The range of this is also along the Pacific Coast but only reaches from California into Oregon with a board foot stand of saw timber of about 7,370,000,000 ft. in California and 9,700,000,000 ft. in Oregon.

Another West Coast specie is Port Orford whitecedar. This also ranges through California and Oregon on the Pacific Coast, but only over about one half the coastline in each state. The stand of saw timber of this specie is about three quarters of a million board feet.

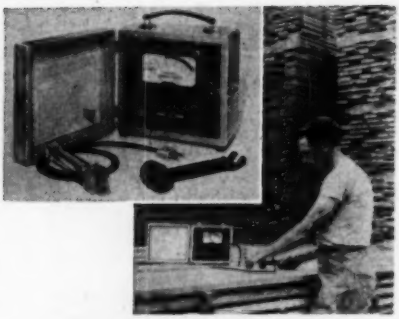
Moving east we have Northern whitecedar which ranges through the eastern half of southern Canada and the Great Lakes to the Atlantic Coast, following the Appalachian Mountains down into northern Georgia. Pole and post timber here amounts to some 800,000,000 b.f. and saw timber 1,200,000,000.

Eastern redcedar pretty well covers the eastern half of the United States from the Canadian border south to, but not including, Florida and the Gulf Coast. The board feet stand of saw timber, posts and poles is approximately 325,000,000 ft.

Atlantic whitecedar ranges along the Atlantic Coast from Maine to, and including Florida with a saw timber stand of about 300,000,000 board feet. In the Northwest there is also a comparatively small stand of the most hardy of all cedars, the Alaska yellowcedar with a range through southern Alaska and British Columbia, Washington and Oregon. This particular specie is very slow growing, taking 200 years or more to reach maturity, often finding far greater value commercially as a cover and protection against the weather than for any other use.

That cedar has long been used by man is indicated by the many references made to it in the Old Testament. References in the Bible as to uses of cedar, include building of "the Temple, beams for a house, Israel's tabernacles of cedar, masts for ships and chests made of cedar." The most famous of the Biblical cedars were the cedars of Lebanon which are mentioned many times.

The use of shingles made of cedar has been traced far back into antiquity.



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In fact, it is believed that hand made shingles, comparable to present-day shakes, were among the first wood products manufactured by man. Cedar shingles for building purposes are mentioned in the earliest of European writings.

The beginning of the western redcedar shingle industry in the Pacific Northwest followed closely after trapping which was the first industry in the region. At the present time the bulk of our supply of cedar shingles comes from this area.

Western redcedar ranks among the large trees of the Pacific Coast and is found from southern Alaska to northern California. It grows at elevations from sea level in the far north to 7,000 feet in the northern Rocky Mountains. It is not uncommon to find trees 150 to 175 feet high and diameters of from 5 to 8 feet. A few have been found over 200 feet tall and diameters of from 10 to 16 feet have been reported. However, in the case of these very large diameters the center of the trees are apt to be hollow. Some of these largest trees are believed to be 800 to 1000 years old.

The Latin name for this western redcedar, "Thuja plicata," refers to a tree having sweet smelling wood whose leaves are plaited or folded. Small inconspicuous yellow and pink flowers of both sexes appear on this cedar in early April. From them develop small, brown, leathery-like cones with about 6 fertile scales, each scale bearing two tiny double-winged seeds which are shed in the fall, leaving the empty upturned cone on the tree.

The bark is cinnamon-red, stringy and fibrous, and rarely over seven-eights of an inch thick.

Products made from the various cedar specie are varied and interesting. Not only do the manufactured products hold important places in our civilization, but in the northwest the Alaska yellow-

cedar is valued most highly in its growing state as a protection against the weather. More and more are various cedar specie being used for windbreaks and landscaping throughout the nation. Slow in maturing, they are not too vulnerable after they have passed the three to five year growth and when half grown will stand pretty tough treatment.

California incensecedar has a purplish, flaky red bark with a sliver sheen on the loosened scales. It later turns reddish-brown and glows in the sunlight. The mature of this specie have widely buttressed bases clothed in thick, shreddy, cinnamon-red bark which is deeply grooved and ridged. At the base of such trees the bark is six to eight inches thick, the upper bark two to three inches thick.

The sapwood is cream colored. The balance of the wood is soft, light brown frequently fringed with red. It has a compact, fine, straight grain, splits readily and evenly and does not check or warp in seasoning. The wood when air-dry weighs about 25 pounds to the cubic foot, is aromatic, takes a good polish and is extremely durable when seasoned. It is used for fence posts, railroad ties, shingles, pencil slats, cedar chests, furniture, door and window frames and for the so-called moth-proof linings for the interior of wardrobes.

California incensecedar has no insect enemies of importance, but dry rot fungus damages materially at least one half the growth. The fungus attacks the heartwood, excavating parts throughout the length of the trunk. Fire causes havoc with the younger trees but once they are fully grown the thick bark makes them practically fire resistant.

Northern whitecedar or arborvitae has pale yellow-brown wood which is aromatic, soft, brittle, coarse grained

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and very durable in contact with the soil. The bark is frequently distorted, thin, fibrous, and light brown in color. A cubic foot, when air-dry weighs only 19 pounds. The heartwood is enclosed in a thin layer of nearly white sapwood. The wood is easy to work and has little tendency to warp or shrink. It splits easily and the fact that the growth rings separate easily reduces its value for most modern purposes, although this peculiarity made it popular with the Indians and early settlers because the thin splints could be used for canoe ribs. Because of its soil and moisture resistance, it is used mostly for shingles, railroad ties, poles, fence posts, buckets, cooperage tanks, cisterns and boat and canoe frames.

This specie is popular for the aromatic oil which is distilled from the leaves and twigs. This oil is used medicinally, particularly for chest colds.

The Latin name for this particular specie is "Thuja-occidentals" and the tree is not strictly speaking a cedar but is an arborvitae—the Latin name distinguishes it from the oriental cedar.

Western redcedar, the largest of this group, also has sweet smelling wood. The bark is thin but very tough and was used by the Indians for making baskets and rope. When air-dry the wood weighs about 30 pounds per cubic foot. It is free from pitch, is medium coarse grained and unusually free from decay and insect attack.

Well over half of the wood of western redcedar is made into shingles. Other uses include lumber, poles, posts, piling, boats, pattern stock, laundry machinery, cigar boxes and green house equipment.

Atlantic whitecedar is a good illustration of the fact that of all names given to trees and woods the term "cedar" is the most confusing. Originally applied to the genus "Cedrus," it has been used for many kinds of trees. Atlantic whitecedar is also known

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as southern white, swamp, coast white, post cedar and juniper. The wood is usually straight-grained, with a fine and uniform texture and weighs about 23 pounds per cubic foot, aid-dried. It doesn't shrink or warp in drying and holds paint well. The wood has a slightly spicy, aromatic odor when cut. In resistance to decay, the heartwood ranks with the most durable making it valuable for siding, porch lumber, telephone poles, shingles, posts, pails, tanks, tubs and the small trees are used for grape stakes, beanpoles and similar products.

Port Orford whitecedar has a limited range in Oregon and California but also has relatives growing in Japan matching it in height and hardness. The principal use of this wood is in storage batteries as separators. This is because of its great resistance to the action of acids. Other commercial uses include venetian blind slats, plywood and aircraft veneers, mine timbers and floorings. An oil is distilled from the wood and is used in making soaps. The aromatic ginger-like odor of the wood causes it to be popular for moth-proof box and closet linings.

The End

THE FACTS OF LIFE

In this 20-page booklet entitled "The Facts of Life on Air and Hydraulic Devices," the Logansport Machine Company has endeavored to present some pertinent "do's" and "don'ts" which will help to obtain maximum performance from air and hydraulic equipment. A guide to proper installation and servicing of hydraulic power units, valves, cylinders, fluid lines, air lubricating units, air valves, air cylinders, airdraulic cylinders and chucking equipment.

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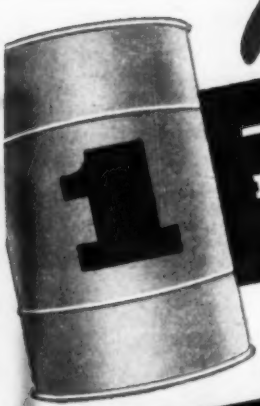

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SECTION

LAMINATE FINISHING For Wood Products

By Thomas A. Dickinson

BY MEANS of a new plastic laminate-finishing process, unusually durable and attractive wood parts are being manufactured for products of Magna Electronics Co., Inc., Los Angeles, California.

The subject parts comprise both solid wood and plywood constituents of cabinets, bases, and bodies for electronic musical instruments, amplifiers, recorders, public address systems, radio sets, phonographs, etc. As shown in accompanying illustrations, they are fabricated with standard machine tools in a more or less conventional manner and may be sub-assembled prior to the laminate finishing process, if necessary.

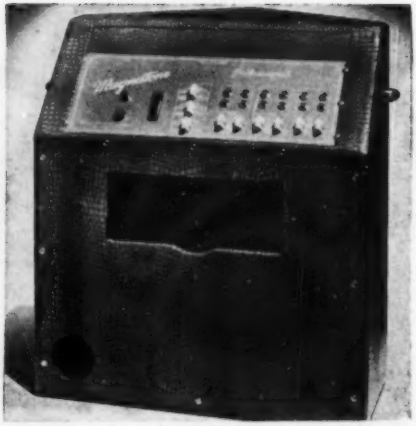
Parts are fabricated from wood where large areas and considerable cross-sectional thickness are required for adequate strength at a reasonably low cost, and the purpose of the laminate finishing tecnique is to provide an unusually thick protective coating which will simultaneously be attractive and durable enough to withstand extensive handling.

The new process consists, briefly, of adhering transparent or translucent plastic sheets to color-coated wood surfaces so as to obtain essence-of-pearl, leatherette, and related blended color effects. Similar effects have been produced by means of other finishing techniques, but none of the latter are known to be adaptable to the requirements of the average wood shop and it is doubtful as to whether any could yield coatings of comparable thickness or equivalent durability.

Surfaces to be finished are first spray or brush coated with colored lacquers, pigmentation of which usually represents the essential color effects that will be attained. Lacquers are used in preference to other types of wood primers, because they can be solvent-softened so as to increase the adhesion of plastic sheet coatings.

Many different types of transparent or translucent thermoplastic sheet materials could probably be adapted for use in connection with the laminate-finishing technique, although "Lu-

A lacquer primer coating is applied to the solid wood base of an electronic guitar, prior to laminate finishing operations.



Housing for the electronic equipment shown here was made from wood, laminate finished for a leatherette appearance.

marith" products have thus far been preferred by Magna Electronics engineers. Lumarith products are cellulose-acetate plastics, available in a variety of sheet or film forms from most plastic retailers and from Celanese Corporation of America, Plastics Division, New York, N. Y.

Since they are both cellulosic material, Lumarith sheets and colored lacquers are mutually soluble in a variety of organic liquids. However, the lacquer thinner combination of acetone and alcohol is considered the best solvent for subject applications because it can be used to thin primer coatings as well as in subsequent operations.

Women workers at extreme right apply solvent soaked plastic sheeting to primed wood surfaces while two remaining workers handle supplementary work.

Remarkable scratch resistance!

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Wood and metal parts are bench-assembled.

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Immediately thereafter, the sheet is taken from its thinner bath and stretched over the surface or surfaces that must be finished. Stretching can be done over fairly abrupt contours or corners, if necessary, and precautions are taken to make sure that no wrinkles or air space will be left to prevent the adhesion of wood and plastic surfaces.

Solvents in the stretched plastic sheet quickly soften lacquer primer coatings on wood or plywood surfaces, causing adhesion to take place at all points of contact as the lacquer and sheet surfaces are solidified by solvent evaporation.

Loudspeakers are installed in laminate finished amplifier cabinets.

This is the final assembly line for electronic musical instruments.

Edges of the stretched sheet may be held in place with tacks or with fixture clamps until all solvent constituents have evaporated, after which a flawless coating with as much as 1/16" thickness can be attained.

Very few difficulties have thus far been experienced due to blisters, "alligatoring," and similar defects which could be anticipated in building up thick organic finish coatings by conventional methods in a short period of time—despite the fact that the finished articles must frequently be drilled, tapped, or otherwise machined for final assembly operations.

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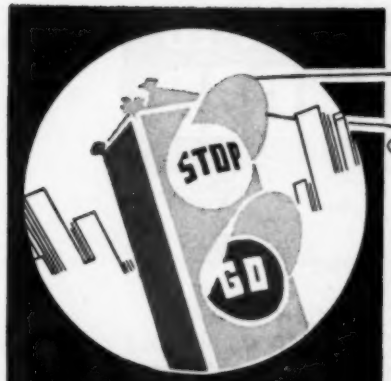

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—Thomas Jefferson

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Nelsonized, high humidity drawer, other wood desk with warped drawer.

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Please send us a sample of the Nelsonite treated wood and wood product
that has been Nelsonized. We are interested in the Nelsonizing of wood and wood products.
Please send us prices and full information on the Nelsonite process.
Company
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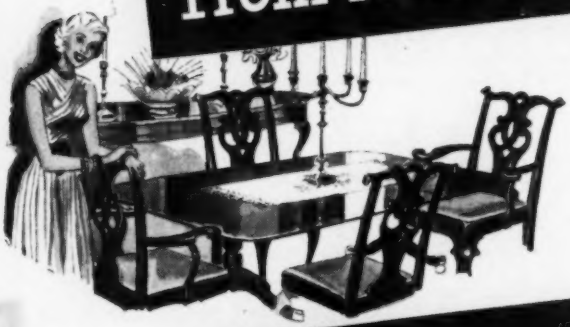
From furniture



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SURFACING

AS IT AFFECTS FINISHING

By Leonard E. Cumming

Finishing operations, in our thinking at any rate, are too often limited to lacquers, stains, etc. However, these very finishes and the success of them are dependent upon earlier manufacturing operations. Preparation of surfaces for finishing is of prime consideration. This article is one of several presented at one of the sectional meetings of the F.P.R.S. at Syracuse, N. Y.

IN GIVING thought to the subject under consideration one should try to visualize a rough board as it is received from the sawmill. Obviously a satisfactory finish cannot be applied to this piece of rough lumber without the aid of some smoothing process that will give a good base for the finish. First of all, this board must be dried to the proper moisture content before it is started through the series of operations that will develop it into core or dimension stock.

One of the first operations to be considered after seasoning is the "strait-o-planing" of the board. This helps to take out the board curvatures and performs the first cutting operation on a portion of the board's surface. As the piece progresses through the rough mill, it eventually ends up in front of the planers at which point it will be dressed down to the desired thickness. Here one must determine whether one or two planer cuts (namely rough and finish) are desired. In most cases, where the thickness permits, it is advisable to use a two-cut procedure since a much smoother surface can be obtained. The developing at this point of a surface free from waves, ripples and tear cuts, is the number one goal securing the ultimate result.

The core stock then proceeds to the veneer department where it will become a part of a 3, 5 or 7 ply panel after the addition of glue and veneers which in turn will build up the panel to its final thickness. Here again care must be taken to insure that the surfaces of the veneers and crossbands are not of the rough-cut type which would distort the panel surface. Proper flattening of the veneers and crossbands during the course of plate drying will also do much to avoid unnecessary distortion. Furthermore, the spread of glue must be evenly applied or this may be reflected in the surface of the panel.

The panel or piece of dimension stock now proceeds to the finish mill where it is cut and shaped to the required specifications. The shaping of edges, etc., may also be considered a part of the surfacing process since the results attained from stickers, shapers, and routers will play a major role in providing a base for that final good finish which is the ultimate goal. As the stock moves to the sanding department one is again faced with a surfacing problem which must be seriously considered before procedures or methods are finally established. As is known to all, it is much more efficient to accomplish

Mr. Cumming is with the Rudolph Wurlitzer Company.

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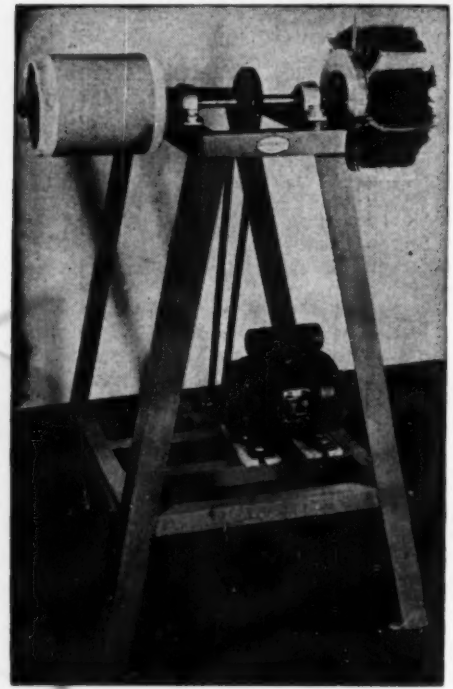

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sanding results with machines rather than by hand, within the normal conceivable limits of what a machine can do.

All of the drum, belt, and spindle operations on the various surfaces of the final product must be analyzed to determine the proper grits of paper or cloth that will perform most efficiently and react favorably with the type of finish to be applied. There is the danger of attaining too smooth a surface as well as too rough a one. With a sequence of sanding operations one must be sure that the grits being used will successfully remove the scratches from the previous operation. Careful study of the texture of the wood being sanded is necessary to determine whether the fibres can be readily cut with normal sanding, or whether a sizing coat will help to do a better job.

In the sanding departments, it will be found that the time spent for analyzing procedures will pay good dividends because it is at this point that, with the proper machine applications, a surface can be brought to the proper standard even though there may have been minor slip-ups in the preceding operations. Here, too, can be controlled the amount of hand clean-up that may be necessary in the cabinet assembly dapartment. A minute spent in the sanding department may save ten in the assembly.

As the parts now proceed to the assembly department where the pieces are combined into a major assembly, the amount of hand cleaning or final touch up that may be necessary will be determined. On the cheaper items of merchandise little time will have to be spent, whereas a first class item will require the services of a person sufficiently skilled to remove all glue, blemishes, and defects that have been missed by inspection, or have been introduced during the course of assembly.

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Here again care must be taken not to develop cross grain scratches or to use grades of paper which might destroy the work previously done in the sanding department.

The assembly is now ready to move into the finishing department. It is therefore essential that the surface so far developed be adequate for the final finish desired. In closing, it should be remembered that in buying a building one gets what one pays for—a cheap building may be expected to have a poor foundation; an expensive building, a good one. Similarly, only on a good foundation can a good finish be built.

The End

The problem in defense is how far you can go without destroying from within that which you are trying to defend from without.

—Gen. Ike. Eisenhower

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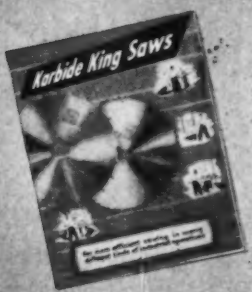

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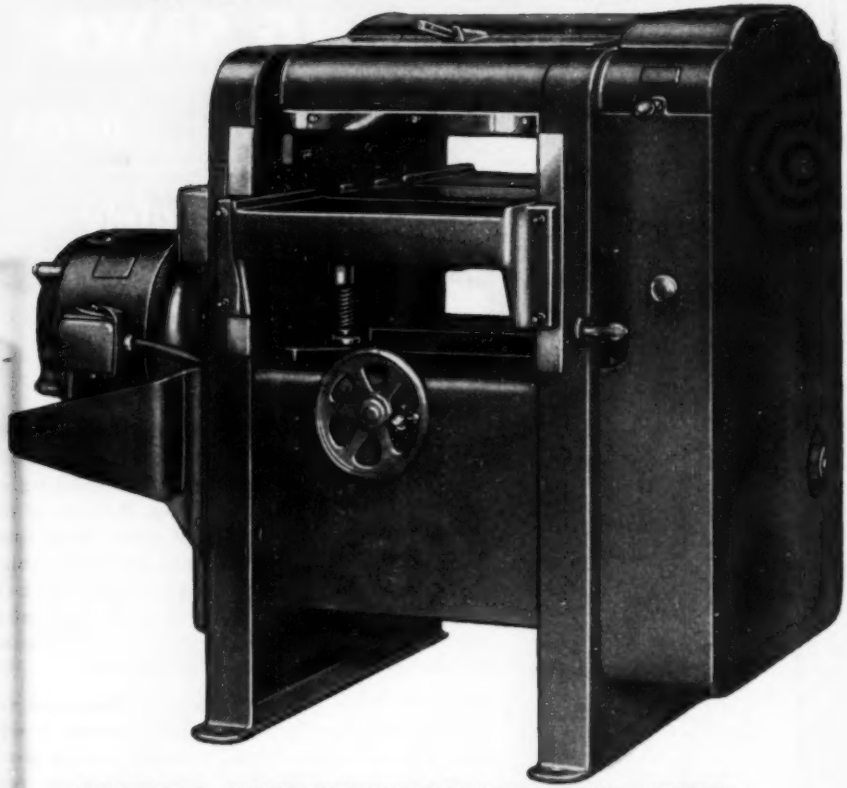

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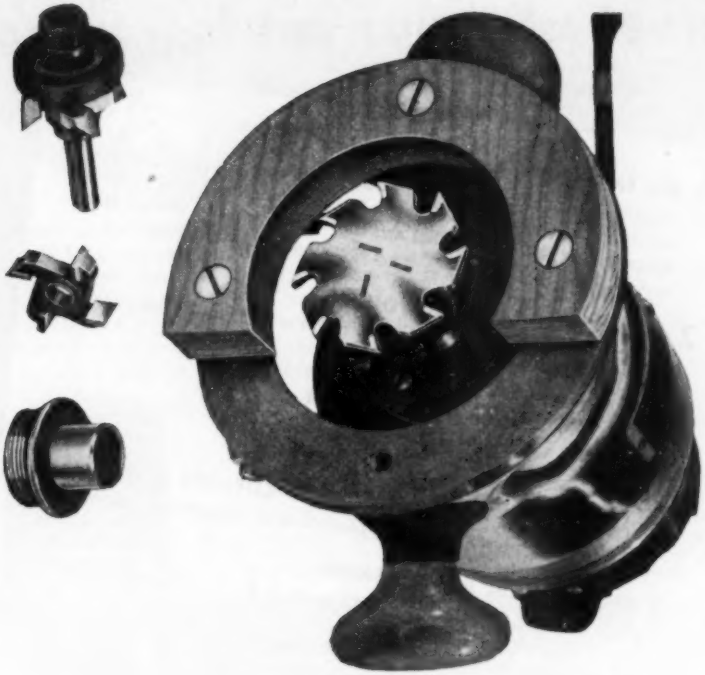

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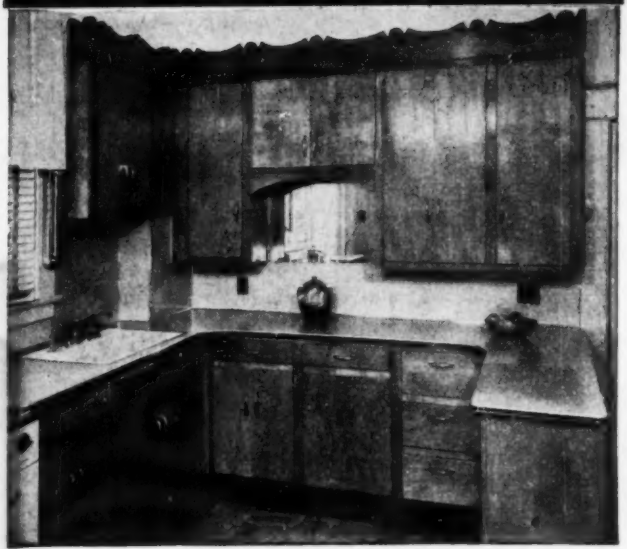

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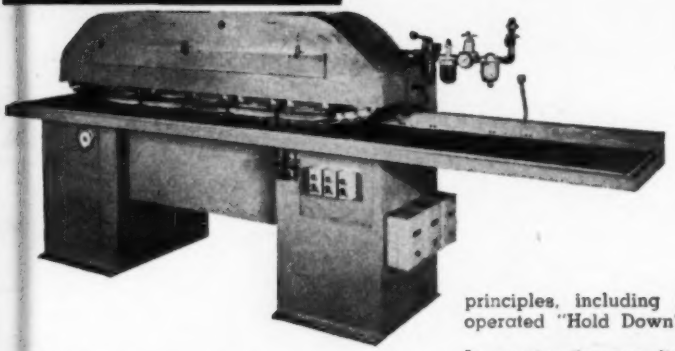
FEATURES

Types of Plywood
Part 2

Veneer and Plywood

WHY NOT TRY THE NEW CONTINUOUS FEED VENEER JOINTER



Our New Continuous Feed Veneer Jointer we believe is far superior to any continuous Feed Veneer Jointer heretofore made.

It has several revolutionary mechanical principles, including pneumatically operated "Hold Down" Shoes.

Its construction permits perfect work on extremely long stock, and it will joint successfully highly figured veneers such as burls, crotches, etc. The machine is equipped with a glue spreading attachment.

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MAKERS OF THE DENNIS TAPING MACHINE

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TYPES OF PLYWOOD

Part 2

Veneer Cutting Techniques

By Thomas D. Perry

WOOD, like a precious stone, does not reveal its intrinsic beauty until it is properly cut and mounted. A rough hewn bolt of wood may have latent beauty that only the skilled artisan knows how to uncover. Thin sheets of veneer, when properly cut, may exhibit a certain type of attractiveness, but the ultimate artistic effects are obtained only when these veneers are selected and matched in interesting figure combinations and firmly mounted on a plywood base. Unless so reinforced, as an integral part of a plywood panel, the veneers do not attain the sturdiness and enduring qualities that add to the warmth and lasting beauty of our homes and public gathering places.

This simile may be continued: most of the wood that is converted from the log into sawn lumber or rotary veneer serves, chiefly, utilitarian ends, where maximum yield is important and appearance is a subordinate factor. Only a few logs, among many, will produce attractive veneer, and fully express the inherent beauty of wood. On the other hand, few rock formations will yield precious stones, with their potentialities for beauty. The bulk of the stone in a quarry is cut and fashioned for structural purposes, where it serves in a utilitarian manner, but having, withal, a massive beauty of its own.

Our concern, in this story, is to show how the few selected logs, with hidden beauty, can be transformed into plywood, which will become an important part of a piano, a table, a chair, a TV cabinet, a paneled wall or a door that will add to the comfort and attractiveness of our homes.

Sources of Veneer Beauty

Some face veneers derive their beauty from the natural color of the species, such as mahogany, walnut, prima vera and rosewood; others from cutting the normal grain of the wood in a plane that reveals ribbon stripes, as in mahogany or walnut, flakes in quartered oak and birdseye and curly effects in maple; another type of face veneer results from the proper cutting of unusual growths, crotches, stumps and burls.

It is an art to "split" the log to discover the best cutting direction for the most attractive figure. The writer knows of no greater fascination than standing at the saw table and watching the opening of a figured wood log. The contrast between the rough outside of the log and the hidden beauty revealed by the opening cut is a rare treat to the lover of woods!

While the sheets of veneer must be properly cut from the log or flitch, this is only the first step in achieving beauty. It must be followed by the trimming and matching of the veneer sheets to remove the ragged edges and to display the grain figure in the most attractive man-

ner. Adjacent sheets of thin veneer have almost identical figure and must be kept in sequence. In the raw sheet this figure is likely to be somewhat uninteresting, rather angling, a trifle irregular and often unsymmetrical.

Experience, imagination and artistry are essential, in taking advantage of nature's growth effects, to develop ultimate attractiveness in the veneers as well as in the resulting plywood.

Types of Veneer Matching

There are many types of veneer matching — limited only by the ingenuity and talent of the veneer worker. Some of the principal types are: — edge matching; end and edge matching, or four way matching; diamond matching; segmental matching; border and inlay matching and checkerboard matching.

Often the type of matching depends on the character of the grain figure in the face veneer and on the shape and area of the plywood to be made.

There are some elusive optical effects that influence the appearance of sheets of veneer, among them the direction from which the light comes and the line of vision of the observer, both of which will vary from time to time. It is a familiar phenomenon to most veneer workers that one side of a face veneer may appear to be several shades darker than the other side. This may be explained, partly at least, by the enlarged vertical cross section of a sheet of 1/28" veneer, shown in Fig. 1. The fibrous or cellular structure of a tree is substantially vertical in arrangement, so that water drawn from the earth can be distributed to the branches and leaves. In spite of this general vertical direction, a myriad of these slightly angling channels or ducts are severed as each sheet of veneer is cut. As one looks at the face of a sheet of veneer, the darker shades will result from looking directly into these minute openings, while the lighter shades occur when the line of vision is far from a direct line into these aperatures. Hence in Fig. 1, the observer A will note a darker shade in the veneer than the one at B. If two sheets of veneer are stood up, side by side, but reversed, one will appear distinctly darker. This is actually a shadow effect, and the play of the shadows, as the light source changes or the observer moves, is one of the fascinations which make wood so interesting. These shadow differences are less conspicuous, but still present, when adjacent sheets of veneer are placed on an edge and an end. No words can do justice to the intriguing and changing optical effects of looking at a beautiful sheet of veneer.

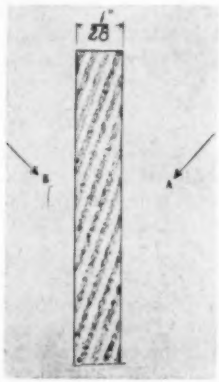

Fig. 1. Enlarged vertical cross section.

Edge Matching of Veneer

A single sheet of veneer, cut to length with trimmed edges, is shown in the top sketch of Fig. 2. The grain figure is a bit angling, and it may look "out-of square." If it is slip matched, as in the central sketch, it is still unsymmetrical, but the color effect is uniform and it will serve for many plainer types of plywood. But when each alternate sheet of veneer is turned, the angling effects are balanced, but the fugitive shades of color become evident. This is called book matching, (lower sketch) as it opens a flitch of

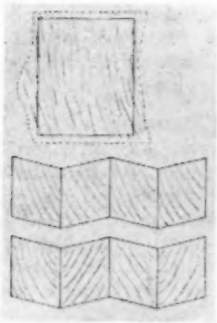

Fig. 2. Slip and book matching.

veneer much as the pages of a book are turned. Book matching is standard practice for most types of moderately figured plywood. Book matching requires that each piece of veneer be a half, quarter or sixth of the panel width, and is a bit more costly than slip matching, which can be made from random widths of veneer.

Another type of edge splicing is crotch matching. Crotch veneer is sliced across a junction where branches meet, and the growth or grain figure somewhat resembles the prongs of a "Y." Since these two arms are seldom symmetrical in size or character, it is customary to split the "Y" down the center, keeping the two bundles separate, and book match the adjacent sheets in each bundle. This produces an effect like a vase of flowers, spreading out in feathery fashion from the more compact base, within the vase itself.

Crotch veneers, due to the predominant cutting across the grain, are the most fragile of veneers, and after maching, should be two-plied to a 1/40" plain veneer back, for safer handling as well as for reducing the eventual checking that will occur under the finish in the plywood. This tendency to check cannot be wholly eliminated from crotch plywood, and the slight inevitable checking is convincing evidence of the use of real veneer, as contrasted with cheap photographic imitations. A crotch veneer, without hair checks after several years of use, is usually suspect by veneer experts.

End and Edge Matching

This is often called four-piece matching, is usually rectangular, and is employed both in plain striped veneer and in stump (or butt) veneer. The

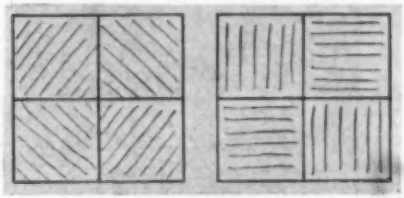

Fig. 3. Four-piece matching.

former is shown in the left sketch of Fig. 3, where the upper two pieces as well as the lower pair are book matched, as also are the right and left vertical pairs. In the right sketch the grain directions are reversed, as in parquet

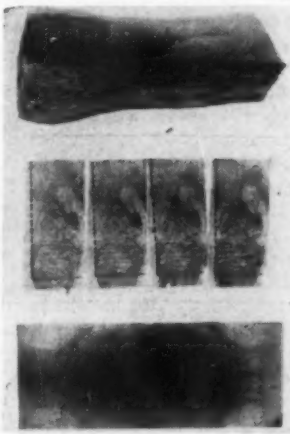

Fig. 4. Matching a flitch of stump walnut.

flooring. This type of perpendicular grain matching is frequently used in interior paneling and modern functional furniture.

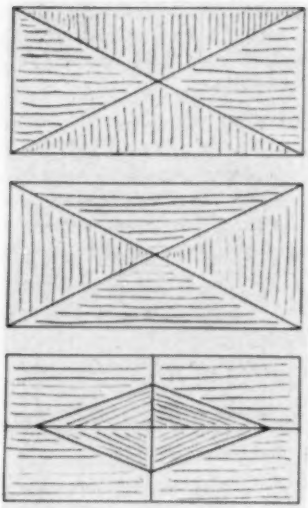

Fig. 5. Types of diamond matching.

The technique of stump, or butt matching is indicated in Fig. 4, the upper photo showing a flitch of walnut stump veneer with ragged edges. To the uninitiated layman, the flitch may appear quite uninteresting, but when an experienced veneer man trims four adjacent sheets, as shown in the center photo, and matches them together, as indicated in the lower photo, the result is little short of amazing. In this lower photo, the four apexes of the dotted lines are brought together. It is to be noted that these apexes appear to be of a light shade in the center photo, but are of a distinctly deeper shade in the lower photo, due to the substantial change in the angle of vision, as was outlined earlier.

Diamond Matching

There are many varieties of diamond matching, more or less of a variant in four-piece-matching, several of which are shown in Fig. 5. In the upper sketch, with the central diamond effect, the veneers are often of contrasting colors. This type is usually more pleasing in appearance than the simple all-over diamonds shown in the two lower sketches.

Segmental Matching

This is really a progression, from the above four piece and diamond matching, into many angling effects, with "pie" shaped pieces, as illustrated in Fig. 6. The mechanical difficulties of making a perfect match at the center are usually overcome by using a small solid center block as shown.

At first glance it might appear difficult to cut these segments with sufficient accuracy, but there is a "trick" familiar to all veneer men. All segments, in some cases only one segment, are made oversize, so that when assembled and taped together there will be a slight overlap at the last joint. A sharp and vertical knife cut through

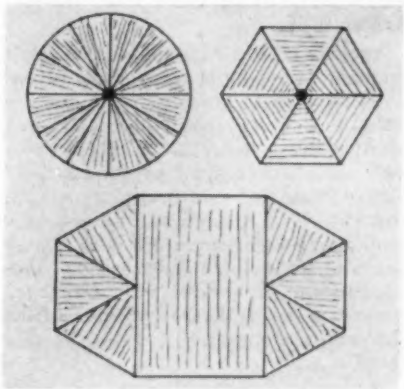

Fig. 6. Segmental matching.

this overlap will permit a snug final joint. The slight differences in size cannot be noticed.

Border and Inlay Matching

Borders on table tops may be both utilitarian and artistic. A straight grained border, as shown in the upper sketch of Fig. 7, gives a sturdiness to the edge that is difficult to obtain in

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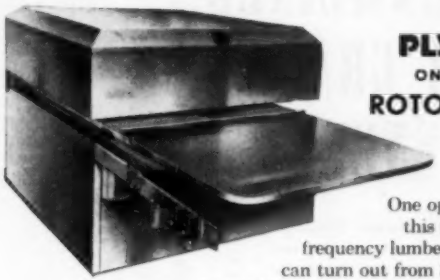

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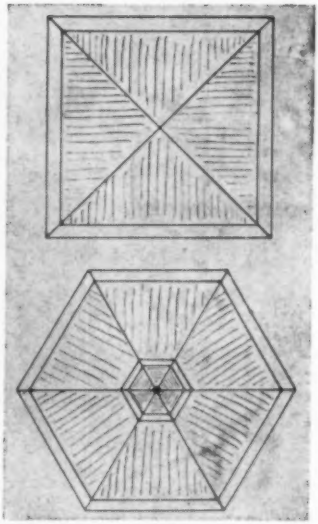

Fig. 7. Borders and inlays.

the several designs of Figs. 3, 5 and 6. Outer corners, with short grain direction, are fragile, and likely to break off in trimming and handling. In many cases it is difficult to glue such fragile corners firmly in place so that they will not break away due to normal wear. From the decorative standpoint, the outer border may be used as a frame design to accentuate the beauty of the veneer figure, as a picture is framed.

There is a bewildering assortment of inlay designs, which can be purchased in strips, mostly in narrow geometrical motifs. Veneers in these motifs may be of contrasting colors, either natural or dyed. In some instances these colors are shaded into each other. Such inlays may be lines of demarcation with normal veneers on either side, or they may be used at the joints between veneers of contrasting colors or figure. A typical example is illustrated in the lower sketch of Fig. 7.

Marquetry is another term applying to inlays, but usually indicates a more

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There is another type of free-hand inlaying, pictures of ships, trees, maps, monograms, etc., limited only by the ingenuity, artistry and patience of the lover of the beautiful inlay wood. Nearly every veneer manufacturer exhibits samples of these in his display room. Many of them are remarkable demonstrations of handicraft in the field of veneers and plywood.

Checkerboard Matching

The making of an inlaid veneer and plywood checkerboard is indicated in Fig. 8, where strips of contrasting colors of veneer, are cut and moved one square into the proper location. Other game boards can be similarly developed. Such game boards are quality items, beyond the competitive range with printed boards, but they are highly

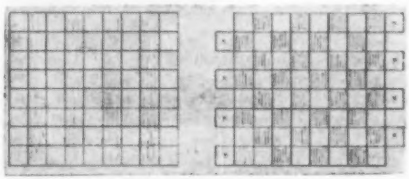

Fig. 8. Checkerboard matching.

prized by those who appreciate the attractiveness of the woods that grow in our forests.

Edge Gluing Matched Veneers

Tapeless splicer machines are indispensable in gluing together the plainer types of matched veneers, such as slip and book matched, but are not adapted to edge joints where there is a preponderance of exposed "endy" grain. In such cases it is necessary to employ gummed tape, usually applied by hand. Such veneer tape should be thin tough Kraft paper, that can be sanded off after the veneer is glued into plywood. As the veneer matching becomes more intricate it may be found difficult to prevent the use of several thicknesses of tape. Every attempt should be made

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to avoid piling up of tape at any spot, as this tape accumulation is likely to become imbedded in the surface of hot pressed plywood, and sometimes cannot be sanded off.

An excellent procedure is to reinforce this complicated matching, after such taping as is necessary, with a backing sheet of veneer, as in 2-plying. This can be done against a slightly resilient cushion, such as basswood, with a minimum of imbedding. The tape can be sanded off the 2-ply before it is glued into plywood. This is standard practice in making "Bentwood" and "Toastmaster" plywood trays, where the sanding of the lower central area would otherwise be difficult and costly.

Conclusions

The proper matching of veneers requires experience, skill and patience. The more intricate types of matching may be time consuming, but they can be rewarding to those who appreciate and can afford beauty in genuine wood. Human skill can do much to enhance the beauty that lies hidden in clumsy rough logs.

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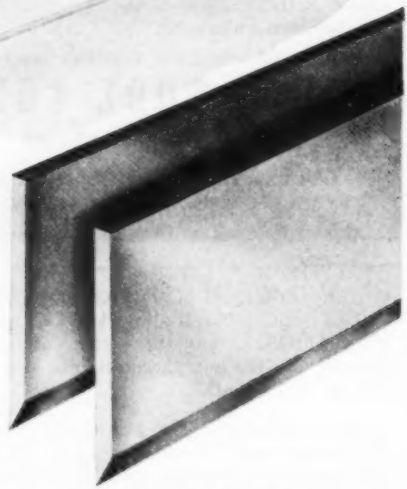

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Hints on
CONTOUR SAWING PLYWOOD

For bandsawing intricate plywood designs, three distinct types of blading are recommended for maximum efficiency, a narrow sanding band may also be used if finish of cut so requires. Parts produced in quantities, more or less, are of course most economically stacked cut (Figure 1) but since high velocities usually prevail, it is obvious that precision depends a great deal on the support of the saw guides.

Figure 1.

The smallest radius or contour involved governs width of blade to use. Minimum radius each width of blade will cut, as based on a 1" material thickness, is as follows:

Blade Width	Minimum Radius
1"	7¼"
¾"	5 1/16"
⅝"	3¾"
½"	2½"
3/8"	1 1/16"
5/16"	1"
¼"	⅝"
⅛"	⅛"

Figure 2.

Choice of blade is determined by the outline rather than material thickness; width of blade seldom exceeds ½". However, a ⅝" or ¾" width should be given the preference when the size of the curve (Figure 2) will permit it.

Figure 2 shows internally and externally sawing of electrical insulating coils of ¼" plywood in stacks of 8 pieces. Blade used in this case is a ¼" - 10 pitch and only one starting hole for the saw is drilled in each stack, all internal corners are squared by notching which in relation to metals means using the saw as a file. The saw welding cycle for each internal cutting operation consumes less than five minutes.

The buttress type of saw should always be first choice because of its fast,

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Figure 3.

cool, clean and accurate cutting properties. The fact remains that this type of band tool is limited to a ¼" width due to its unique tooth spacing, this minimum width will not therefore navigate a radius smaller than ⅝". The next narrow width choice is the ⅛" standard pitch band which cuts a radius equal to its width, and even slightly smaller by proper maneuvering of the work. From here on, the spiral saw (Figure 3) takes over and even the smallest curve is of no consequence because of the 360° cutting edge of this tool.

The illustration demonstrates shaping plywood molding with .040" diameter spring tempered spiral saw, thus leaving only a .020" radius at corners. This particular saw cuts exceptionally fast on any soft wood or wood derivative up to 1" thickness, the .074" diameter saw is recommended for the harder woods and it will cut through ½" maple at the rate of 30 lineal inches per minute. Spiral saws, also available in hard-edge form for metals, are naturally not effected by throat depth limitation of machine since they cut in all directions without turning the work.

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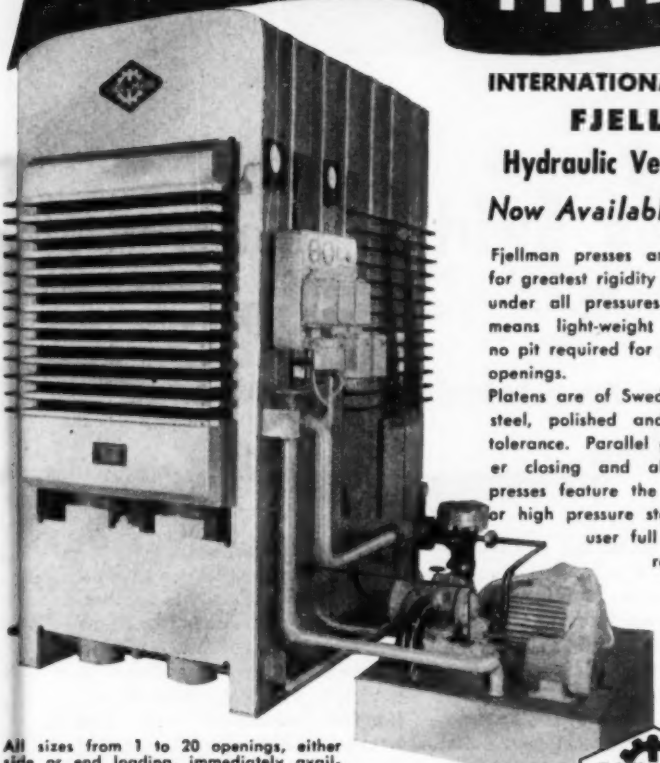

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VENEER and PLYWOOD

By Ned Bailey

Part 14

IT IS interesting to see in these days of war restrictions on metal the return to, or adoption of wood in various forms for making many things. Plywood and veneer play a most important role in this situation, the more so, due to the development and improvement of impregnating and adhesive materials and equipment.

There is practically no branch of the war department's many field activities that does not include something made through the use of either veneer or plywood themselves or in combination with other materials such as pressed wood, fiberboard, metals, minerals, paper, cloth, plastics and other wood materials.

Kraft paper and wood veneer make a typical combination of real value because the Kraft paper is somewhat stronger across the grain than thin veneer and is used as a good reinforcement. The paper is used either as a core, between layers of veneer, or for the outside surfaces. This combination is used extensively for packing cases, mirror backs and cabinet partitions. Drawer bottoms and dustproof boards in case goods are often made of three-ply phenolic-impregnated papers and wood veneers.

Fiberboards such as Masonite, Celotex and similar materials can be faced with veneers. Veneers used in this manner generally range from 1/3 to 1/60 inch in thickness.

Heat protection in radiator enclosures and similar applications such as covering hot air ducts, boat and ship partitions and doors and partitions in slow-burning construction are being satisfactorily made from a combination asbestos board and wood veneer. Flush doors made of a non-burning material and veneer have been OK'd by the Fire Underwriters Laboratory, passing tests metal doors weren't able to.

Cloth-veneer combinations have important applications. A commercial example is Flexwood a product used for interior wall finish. This product consists of a thin hardwood veneer from 1/100 to 1/4 inch thick, laminated under heat and pressure with a waterproof adhesive to a coarse cotton fabric. The sheets are then processed in a flexing machine and the result is a flexible material with a hardwood surface. Flexwood is made in strips from 18 to 24

inches wide and 8 to 10 feet long. It is applied like wall paper on either a flat or curved surface. Conveyor belts and guard cages around the machinery are also made in a similar manner, the woven fabric supplying the flexibility with the veneer producing the desired surface and degree of stiffness.

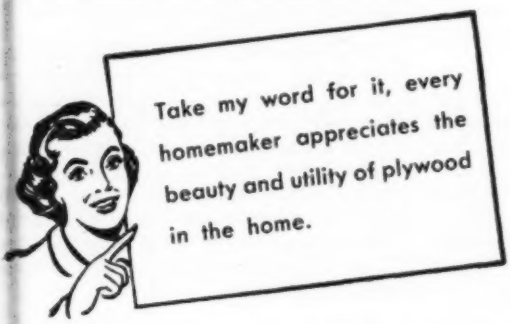
Wood veneers and metal sheets have been finding more and more uses. There are several trade marked descriptive names applied to such metal and wood combinations, often referred to as plymetal. There are many different combinations of veneer and metal that are used, the arrangement being regulated by the end use of the product.

By combining wood—which is light in weight, has good insulating values for both heat and sound, is low in cost, has excellent stiffness properties and is comparatively easy to work—and metal with its high density and strength, surface hardness and fireproofness, a product suitable for many uses is achieved. There are many combinations of these two materials such as metal on one or both faces, metal in the center or directly under the face.

Plymetal has been used successfully for floors, sides and cabs of trucks and buses as well as walls and roofs of the latter, parts of streamlined trains and freight cars.

Where great strength with light weight are essential as in aircraft construction aluminum-alloy plywood construction has proved of great value. Special sandwich constructions with metal surfaces and low-density interiors have developed remarkable stiffness in such parts as floors, cockpits, bulk heads, etc.

Steel, aluminum, plastic, cork and linoleum are used, backed by lightweight plywood for stiffness and heat insulation, in the construction of many pieces of hospital, laboratory and



And when you use plywood, turn *first* to DEACON where ample stocks, central location and courteous sales people make buying a pleasure and delivery prompt.

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Established 1890

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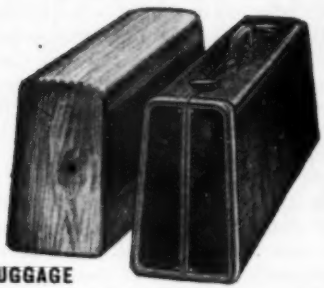
INDUSTRIAL WOOD PARTS
by WEYERHAEUSER



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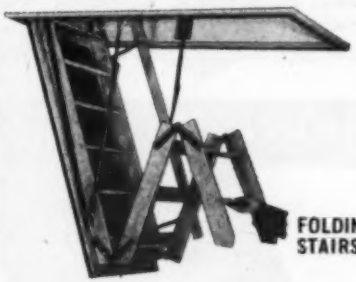
GRAIN CLEANER

TOYS



FOLDING STAIRS

● Leading manufacturers in many industries find Weyerhaeuser a dependable source of supply for wood parts. Blanks of Western softwoods are cut to size for assembly and finishing in their plants. A number of other customers find it more economical to have Weyerhaeuser handle certain of the moulding operations.

Partial or complete fabrication of wood parts by Weyerhaeuser usually means attractive economies by avoiding waste . . . saving freight . . . saving factory floor space . . . speeding assembly . . . reducing inventory through rapid turnover.

Weyerhaeuser's large-scale facilities permit mass production for lower costs as well as for product uniformity. We may be in position to help you simplify your fabrication and reduce costs. A letter will bring you complete details as to how we can serve you in the direction of efficiency and economy.

Weyerhaeuser Sales Company

Industrial Wood Parts Department

Room 2132 • 400 West Madison Street • Chicago 6, Illinois

kitchen equipment. Table tops, drain boards, kitchen cabinet tops and counters, refrigerator cabinets and many similar products can be kept cleaner and wear longer with metal surfaces on plywood.

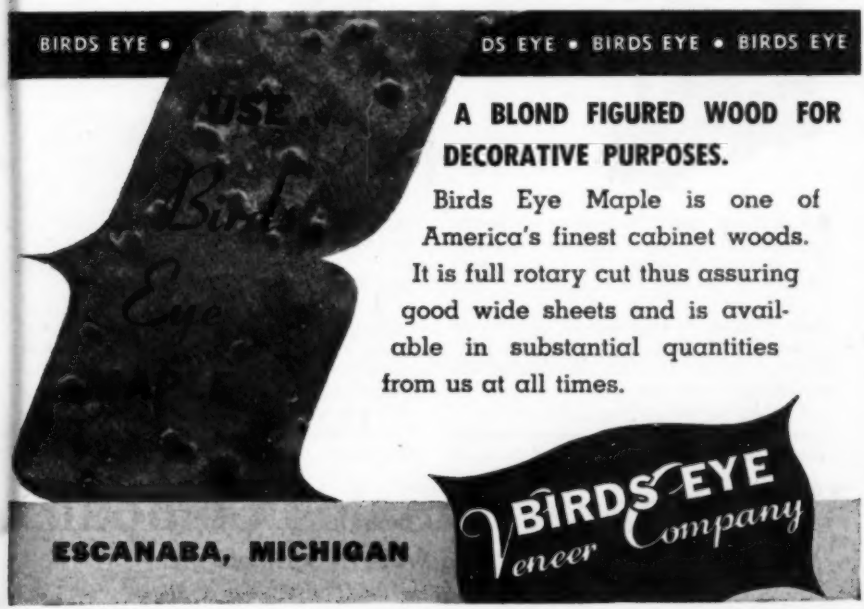
Where fireproofed areas in buildings are desirable or required by code such as elevator enclosures and cabs, stairways, office partitions, conveyor enclosures and the like, plymetal has proved to be very acceptable. In these cases steel or other metal sheets are used as either inner or outer layers.

Small industrial buildings, warehouses, outside offices and shelters for firefighting or other equipment, switch and signal towers, crane cabs and guard booths built of plymetal are considered economical in many ways. For example, they provide safety from fire, fair insulation for warmth, sturdiness and portability.

Table tops for coffee and serving tables, bank counters, smokers, desks, etc. for office use with metal tops or metal veneer directly beneath the wood veneer finish ply protect the outer wood surface by absorbing and distributing the heat from lighted cigarettes, etc.

In veneer-paper combinations the paper may or may not be impregnated with synthetic resin or other preservative. The United States Plywood Corporation has developed a trade marked paper-veneer combination called Tekwood in which a single central layer of hardwood veneer is faced on both sides with a heavy Kraft paper. It is resin bonded in hot presses resulting in a tough sheet that can be punched like sheet metal, is stronger than its equivalent thickness in metal. The dielectric qualities of this product make it especially well suited for radio and electrical equipment and many other similar applications.

In making metal and wood combina-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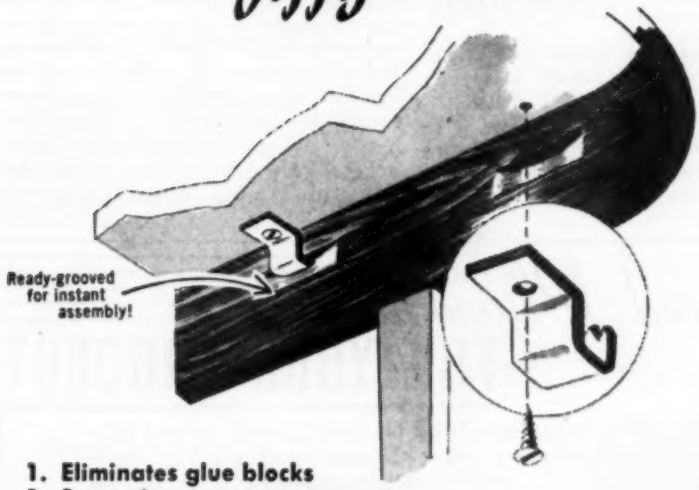
MOLDED PLYWOOD TABLE APRONS

WITH OUR EXCLUSIVE NEW FEATURE:

THE *Jiffy-set* BRACKET



1. **Eliminates glue blocks**
2. **Saves time... cuts costs**
3. **Allows easy, speedy assembly!**
4. **Furnished free with order**

Molded plywood table aprons and chair rims... cut to length, according to your specifications; faces selected for color... sanded... shipped ready for finishing. Write for our catalog.

NO MINIMUM QUANTITIES REQUIRED ON STOCK MOLDS!

LAMINATED VENEERS CO.

Dept. W—, 100-07 92nd Ave., Richmond Hill, L. I. 18, N. Y.

tions of plymetal, the adhesive technique differs considerably from that of wood to wood, special types being required.

Casein-latex combinations have been used extensively in gluing up Plymetal for transportation industries. The metal usually used is steel or galvaneel of 16 to 24 gauge. As a rule, the metal is glued to the completed plywood in an added gluing operation, after the plywood has been trimmed to the size required and after it has been sanded and surfaced. In some instances canvas layers are interposed between the metal and the veneer to eliminate any tendency to warp.

There are several things that must be done to get good results in metal to wood bonding. The metal surface to be bonded must be thoroughly degreased and cleaned, which can be done in any one of several ways. Acid etching, scouring with an abrasive detergent or solvent degreasing are three methods recommended for cleaning the metal. As an indication that it is cleaned adequately, a continuous water film spread over the metal will show no breaks or separations. Roughing up the metal surface by sand blasing or rubbing with mineral wool will help provide stronger adhesion. Glue lines should be thin. Therefore, all the surfaces both metal and wood, must be accurately fitted, and the bonds also require substantial heat and pressure to get the best cure suitable for severe exposures.

The importance of the adhesive used in metal to wood bonding and the gluing-up procedure differ with different metals and different woods and the different thicknesses of each. To get the best results we recommend that the user consult the manufacturers of both adhesives and gluing equipment in order to get the latest information on the subject. Both of these groups of suppliers

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FOR YOUR PRODUCT

Write today for information on how Larson curved plywood can become a part of your products . . . how solid woods and costly substitutes can now be replaced. The results will be lower costs . . . greater strength . . . and added sales appeal for your products. Such has been the experience of other manufacturers who took the time to write. *Do so now . . . no obligation.*

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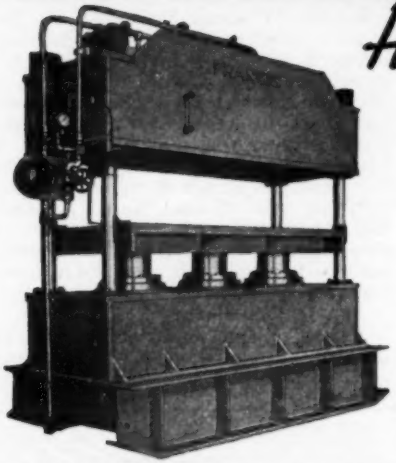

Hydraulic COLD PLATE Presses

Francis presses are available for all types of laminated work in standard sizes up to 5'x12' platen size. Sturdy, heavy duty construction throughout, custom built to your specifications ... operation is simple and economical ... workmanship of highest quality.

GLUE MIXERS—Mixers for every purpose and all types of glues . . . double agitation plus sweep paddle to prevent settling of glue fillers. Available in sizes up to 200 gallons, with or without stands. Can be used for mixing paint, rubber cement, etc.

GLUE SPREADERS—Pay for your glue through savings with Francis Double Roll Glue Spreaders designed for proper application. Single top and bottom coating machines, laboratory and experimental models. Simple and accurate adjustments . . . easily and quickly cleaned . . . in sizes from 12" to 108" in length.

● *For Illustrated Literature and Details write direct to* **CHAS. E. FRANCIS CO., Huntington, Indiana, U.S.A.**

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EXCLUSIVE REPRESENTATIVE PLYCOR COMPANY
DIVISION OF EARLE HART WOODWORKING MACHINE COMPANY
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deserve a great deal of credit for the amount of time and money they have invested in the perfecting of their products. Most of them advertise in WOOD WORKING DIGEST. However if you need any special information on this subject don't hesitate to write me. If I don't have the answer I am sure I can get it for you.

The End

MOLDED PLYWOOD AS STRUCTURAL MATERIAL

Keller Products Inc., of Manchester, N.H., in conjunction with the military shelter program have developed bonded plywood structural "I" beams.

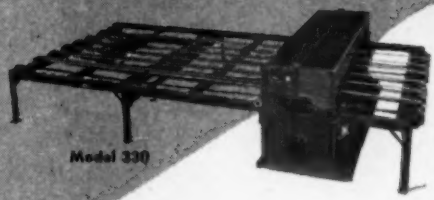
From the design engineering aspect, this product has the advantage over other types of wood members in that each sheet of veneer going into the construction is carefully inspected. Therefore, the structural member would consist of clear straight grained stock as would be a test specimen used in determining its basic strength. In calculating the loading capacity of the molded plywood structural member, the reduction for grade of its basic strength would not be necessary.

Similar "I" beam units can be devised to meet the strength-weight ratio required in larger and heavier construction. The successful application of 1" x 10' molded plywood angle units for the Unicel freight car is indicative of the use of molded plywood in heavy construction. These angle pieces were used as corner parts on lap, bottom and sides of cars. Keller Products Inc., has developed various types of structural plywood as well as component parts for aircraft, instrument cases, radar masts, etc.

A mail plane takes off to get up whereas a plain male gets up to take off.

Check YOUR LOSS FACTOR from LATHE thru CLIPPERS!

COE
VENEER
MACHINERY


Model 330

Economy of clipping operations is proportionate to the efficency of the clipping and handling equipment used.

Make sure your veneer handling and clipping equipment is delivering the highest quality and the maximum quantity of usable veneer with a minimum loss factor from lathe through clippers.

Coe veneer clippers are available in a variety of types to meet all clipping needs.

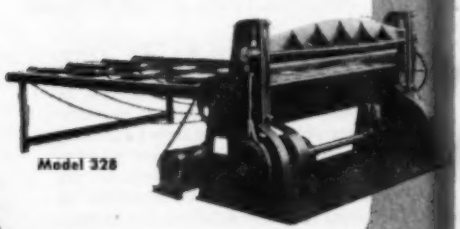
Consult us regarding your specific problems without obligation.

Model 346

Coe Model 330 Automatic Panel Clipper. Multiple Knife for sizing single sheets of veneer in meter. Position of cuts are selected by means of a timing chain moving at same speed as veneer.

Coe Model 346 Air-Operated High-Speed Single Knife Clipper for sizing single sheets of veneer in meter.

Coe Model 328 Motor Actuated Clipper for clipping multiple layers of veneer. High torque motors operate table and knife. A push button controls the feed table and a foot switch operates the knife.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Lathes • Clippers • Dryers • Knife Grinders

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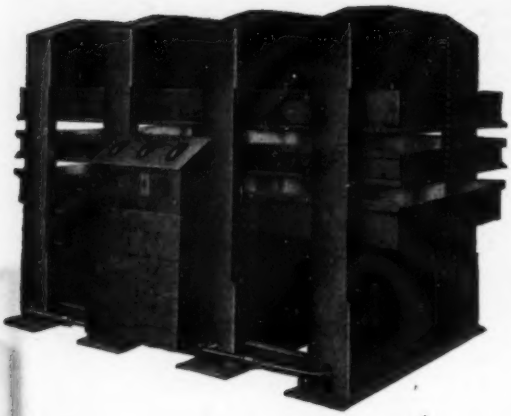

for increasing production of your veneering and laminating operations

The New

VB hot press

Check ALL these "Years Ahead" features that give you . . . . .

ACTUAL PRODUCTION ADVANTAGES

The modern design of the "VB" Press gives you savings in glue, veneer and labor. After-drying storage space is eliminated and the smoother surface of panels produced eliminates sanding and finishing costs. Compactly constructed, the "VB" Press requires no pit; giving the user a wide choice of placement for more efficient production.

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AVAILABLE IN ONE, TWO, THREE OR FOUR OPENINGS

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MOISTURE CONTENT CONTROL
At Birds Eye Veneer Company

Like many other woodworking firms, Birds Eye Veneer Company, Escanaba, Michigan, experienced seasonal difficulty with the moisture content of their products. During the colder weather, heating the packing room and warehouse to a comfortable working temperature resulted in lowering the relative humidity. As a result, the finished veneers which had been dried to the proper 8% to 10% moisture content after cutting, continued to lose moisture in the packing room and storage areas until the equilibrium moisture content was much too low. It became apparent that something would have to be done to preserve the flatness and proper moisture content in the veneers.

The extent of the drying effect can be shown by a simple example. Let us assume the outside temperature was 30° and the relative humidity 70%. When the air entered the plant and was heated to 75°, the resulting relative humidity should have been less than 15%. Actually, there were sources of moisture in the building which would tend to raise the humidity, and of course there were also colder and less humid days which would tend to make the inside relative humidity even lower. The net result was, as in most other heated factories, a relative humidity in the vicinity of 20% during the winter months. Veneers and other wood products exposed to this condition lose moisture rapidly in attempting to reach equilibrium. The equilibrium moisture content is around 4% to 5% at such conditions. Veneers at Birds Eye became brittle and wavy in the dry atmosphere.

It was decided that the most logical solution to the problem would be addition of automatically controlled humidification equipment in the packing room and various storage and warehouse areas. This would allow the maintenance of a sufficiently high relative humidity to hold the equilibrium moisture content of the veneers at the proper level. Reference to published information showed that to maintain an e.m.c. of slightly over 8% would require a relative humidity of 45% at room temperature.

Birds Eye purchased centrifugal humidifiers manufactured by the Bahnson Company of Winston-Salem, North Carolina. These units take ordinary city water and atomize it, by centrifugal force, into a fine mist. This mist evaporates readily in the room atmosphere and distribution of the moist air throughout the room is accomplished by a fan on each unit. Each humidifier can evaporate up to eight gallons of water per hour and is economical to operate, being powered by a one-fourth horsepower motor.

The humidifiers were furnished with automatic humidity controls which regulate the operation of the units to maintain the required relative humidity. Thirteen units were installed, six of which take care of the requirements of the large warehouse which is 100 by 200 feet and 15 feet high. The maintenance department of the plant made the installation.

FIELD
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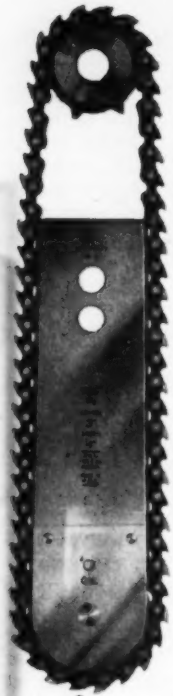
CHAIN MORTISE CUTTING EQUIPMENT



SUPERIOR chain mortise cutting equipment made possible through Field research and experience . . . Many profit making improvements which you can test for yourself. Cut costs . . . raise quality . . . increase production with Field mortising equipment.

More than 90 standard sizes of cutting equipment to assure you on excellent product and interchangeable replacement parts.

When ordering, please specify:

1) Size of mortise (width and length)
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3) If reordering, give marking on guide bar.

Write for information on our chain grinders for sharpening your mortise chains.

Complete mortising equipment at . . .

NEW ENGLAND'S WOODWORKING MACHINERY DEPOT

WILLIAM H. FIELD CO.
327 Dorchester Ave.
BOSTON 27, MASS.

Bahnson centrifugal humidifier with automatic humidity control in veneer storage room of the Birds Eye Veneer Co.

The original humidification system has now been in operation nearly three years. The units have worked well, especially during the winter months. In early 1951 seven additional centrifugal humidifiers were added for humidity control in other parts of the plant. The humidification equipment requires little attention and has allowed Birds Eye to maintain the proper moisture content in their veneers right up to the time of shipment. It might be pointed out that during shipment, whether by rail or motor, the temperature is usually low enough during the winter months to allow the veneer to maintain the proper moisture content.

The fact that the veneers are delivered in the proper condition, however; is no guarantee that they will maintain the proper moisture content through the final steps of manufacture into fine furniture, panels, etc. If the purchaser of the veneers stores them in a dry atmosphere before using, or manufactures the final product in dry machine areas, there is danger of the veneers again losing moisture and causing difficulties. The user of veneers

Veneer packing room at the Birds Eye Veneer Company, showing humidifier.

should investigate humidification in such cases.

Birds Eye Veneer Company has taken advantage of the simple and efficient humidification equipment available and has solved one of the big problems facing northern woodworking firms in the colder months.

ELECTRIC DRIVE FOR LOG AND LUMBER HANDLING

A new electric drive for log and lumber handling, called Motocylinder, is available from Westinghouse Electric Corporation. It is designed for use in lumber mills, providing the reciprocating motion necessary to operate log haul unloaders, roll case unloaders, deck stop and loaders, pin stops, lift skids, chain transfers, hinged table transfers, log-kickers, and hinged sweeps.

Available in ratings of 1 to 20 h.p. with crank strokes of eight to 24 in., these Motocylinders provide a lifting force of 900 to 15,000 lb. at full stroke speed.

For further information, write Westinghouse Electric Corporation, Box 2099, Pittsburgh 30, Pennsylvania.

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K5 Band Saw Filing Machine files, sets and joints band saws with absolute uniformity.

The result will be quickly noticed in cleaner, faster cutting and longer period of service obtainable from each blade.

K5 requires no further attention after the saw is clamped in the vise. The blade is clamped while being filed and set. Its speed is the equivalent of four men working by hand and replaces two separate machines formerly required for this work. For details write for Bulletin on K5 Band Saw Filing Machine.

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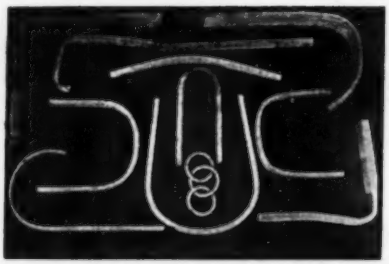

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A handy book of accurate tables for quickly determining square feet contents of veneer and the cubic contents of logs, complete to fractional units.

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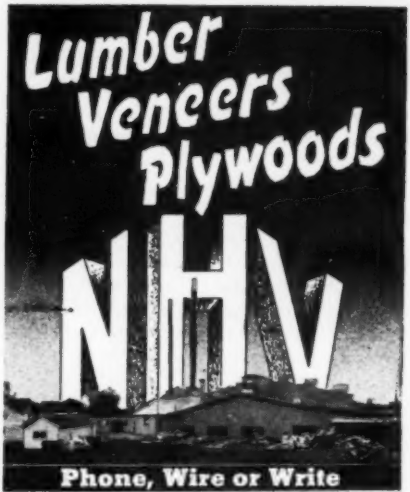

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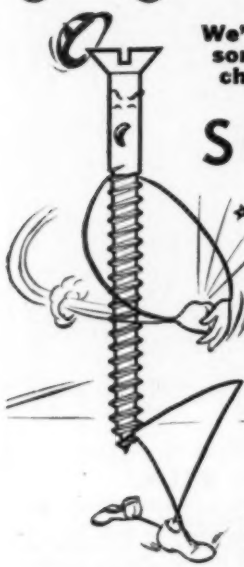

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We've seen it happen time and again. Folks just plain like Southern screws, because they find that every one is perfect — no chips or blanks.

Every Southern screw has a sharp gimlet point for easy starting, and a clear cutting edge for straight driving and tight fit. And because of their single-thread construction, Southern screws are rugged in body and shank — no breaking or twisting. And they're made of the very finest materials obtainable.

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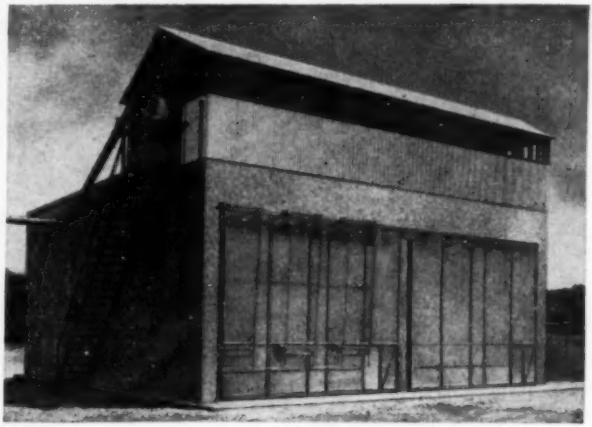
Wood Comes Back to The Navy

Pudget Sound shipyards are building a fleet of non-magnetic mine sweepers —of wood. Spanning the era of steel ships, wood, which made the ships of earlier days models of grace and beauty, is coming back to the shipways.

This is not by choice of the builders. It is because we have reached one of those points in the design of munitions when one of our own inventions, the magnetic mine, is turned back upon us, and is giving us some bitter experiences. Sensitive mines sown by the enemy in the waters around Korea and Formosa have made the steel sweepers obsolete. Even wooden ships with steel fastenings, and outfitted with steel equipment, are not safe enough.

Magnetic mines are adjusted to float about eight feet under the surface.



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IMRIE SIPHO-FAN KILNS

Any plant interested in the highest possible quality and overall efficiency when drying lumber can afford the latest in lumber drying equipment. IMRIE'S recognition in this field stems from a reputation for doing just that type of job . . . not from a high overall cost of kiln equipment or construction. Imrie's efficient kilns are a matter of record in the industry. This is a result of many factors, all of which add up to better design and more efficient operation.

IMRIE KILNS USE

- LESS STEAM due to the use of copper coils in all unit heaters and the added efficiency of IMRIE design.
- LESS POWER because only one-half the air is passed through the fan, the balance being re-circulated by the use of high velocity siphoning jets.
- BETTER AUTOMATIC CONTROL with the exclusive ElectroniK Multiple Thermocouple Control System.

You get all these advantages at the cost of ordinary dry kilns and in addition IMRIE has the only system that is especially adaptable to the remodeling of Cross-pile Kilns without changing the original kiln layout.

IF YOU ARE CONSIDERING A NEW KILN OR THE REMODELING OF YOUR PRESENT EQUIPMENT, IT WILL PAY YOU TO CHECK WITH IMRIE FIRST.

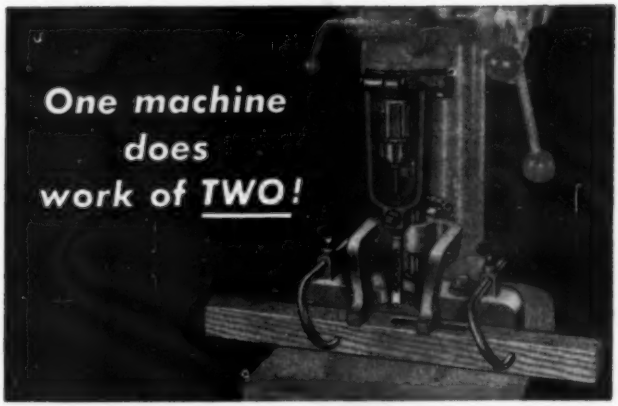
IMRIE DRY KILN COMPANY

PEARL & OTTAWA GRAND RAPIDS, MICHIGAN

When a vessel containing any magnetic material comes along, the mine snaps to the hull with such force that it is exploded.

The new sweepers are 170 feet long, 49 feet beam, and of shallow draft. The keel is laminated and glued on the shipway. All ribs, knees, horn timbers, keelsons, deck beams and other parts are made by Associated Wood Products, which has doubled the size of the Seattle plant to handle the new business. Each part is built up to its designed shape with boards cut to dimensions and then glued in a heavy press. The glue is dried rapidly by newly designed high-frequency radio machines.

These pre-fabricated parts are harder and stronger than natural wood, far superior to the intricately formed parts turned out by the old-time shipwright



WALKER-TURNER DRILL PRESS

easily adapted for mortising

Drilling is only one of many woodworking operations Walker-Turner Drill Presses are designed to perform. With the attachments shown, for example, you can easily adapt these precision machines for mortising.

Mortising Attachment, when clamped to drill press quill, holds mortising chisel in position. Sturdy Hold-down and Guide is readily adjustable for guiding the work and securing it when chisel is withdrawn.

At your Walker-Turner Distributor's, or write for Catalog A.

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DRILL PRESSES JOINTERS TABLE SAWS BAND SAWS BELT and DISC SURFACERS
JIG SAWS RADIAL SAWS LATHES TILTING ARBOR SAWS

of the days of square-rigged ships. These new sweepers should surpass metal design in resiliency and adaptability.

What their construction portends in the construction of other kinds of ships, it is not possible to say. We went to extremes in the construction of concrete ships, which failed because of their rigidity. Now we have swung back to wooden ships for a special purpose. But in them we are using pre-fabricated parts which are comparable to steel for the actual requirements of a ship, with more give-and-take in their performance.

Lumbermen and woodworkers will find this development interesting, and it may attract the attention of more ship builders who see in it an entirely new industry in the making.

WILLSON
Safety Goggles
Keep You on the Safe Side
Style TAW50 for heavy duty with
• WILLSON Super-Tough® lenses
• Comfort-fitting eye cups
• Adjustable chain bridge
• Side screen ventilation
• Lenses easily replaceable
More than 300 other Eye and Respiratory Safety Devices carry this trademark
WILLSON®
Dependable Products Since 1870
WILLSON PRODUCTS, INC., 123 Thorn St., Reading, Pa.

SAFETY POSTER

A striking new safety poster is being offered to industry by Willson Products, Inc., manufacturers of personal safety equipment at Reading, Pa. The poster has two scenes—one a hunter with his dog; the other, a blind man with his dog—a "Seeing Eye." The headline is the challenging question "Which Dog Would You Rather Follow?"

Quantities for posting on plant bulletin boards are available at no charge.

This is a most effective way of promoting the importance of safety goggles.

If every American faced the reality of what the fulfillment of the Communist objectives means to him, he would be inspired to work harder to protect and preserve the individual liberty and freedom which is part and parcel of our American way of life.

—J. Edgar Hoover

NOISE REDUCTION . . . BOOSTS PRODUCTION

By Ernest W. Fair

There are many factors that influence accident rates. Noise is one not easily recognized as such a factor by most of us. Mr. Fair has showed us how "noise reduction boosts production," but it also boosts employee efficiency and lowers accident frequency. Though not specifically labeled "safety," we believe this article has a direct bearing on the overall problem of safety.

"THINGS didn't seem quite so noisy when I was a youngster," declares Grandma today and the venerable old lady is very right. Noise has been increasing in every part of our lives as each year has gone by and we have become so accustomed to its presence that we have lost account of its effect upon us.

The modern cooperage plant is no exception. Despite machines and equipment that operate a good deal more quietly than they did 20 years ago, there is still too much noise in most plants.

That "too much noise" means production efficiency of every man and woman in the plant has been decreased in proportion to its volume. Surveys after surveys in actual plants have shown that the direct efficiency of people therein decreases as noise increases. Nerves become jagged and when they do, even the best of us suffers a loss in our ability to do the job right.

The problem of noise abatement is not one requiring great expense to handle. It takes very little investment in materials or time to greatly curtail noise in the average plant And every cent spent toward noise abatement is soon returned in more efficiency and accuracy from every employee therein —increased volume of work that flows through the plant during each work period.

Noise abatement is seldom an expense—it is nearly always a good investment.

The first step in abatement of noise in the plant is one of measurement. A unit called the decibel has been standardized and an instrument made to register sounds in that unit. This unit is defined scientifically as the smallest change which the ear can detect in the level of sound.

To give an idea of how this rating applies here are some findings of the Noise

Abatement Commission of the city of New York:

Quiet whisper—10; average whisper —20; quiet automobile—50; average residential street—60; average motor truck—75; riveter—100; air plane engine—110. Painful sound begins at a rating of around 130.

The noises made in our plants will of course vary from one to the other. The reader, using the above sounds with which he is familiar, can secure a rough estimation of the noise level in his own plant by comparison with the above ratings. Too many, we fear, lie between the motor truck and airplane engine range as above; a great deal too much noise for efficient workmanship on the part of any plant employee.

Noise interferes very seriously with plant workers. It lessens their attention to details of their work and makes concentration upon any task extremely difficult.

Excessive noises also cause loss of temper, they play a part in quarrels, and they prevent any appreciable amount of thinking. The human nervous system comes under great strain in attempting to overcome the effects of noise.

Research workers have discovered time and again that the effect of noise is emotional and that in turn means distrubance by reason of stress vibrations in heightened pulse rate, blood pressure, some irregularities in heart rhythm and an increase in pressure on the brain itself.

Reduction of noise in the plant begins by classifying such noise into that which is preventable at the source and that which is not preventable at the source. The former can be handled by damping, machine adjustment and in many cases, parts replacement and repair.

Screening, absorption, filtration and isolation by suspension are methods of preventing noise not readily prevented at the source.

Damping is accomplished by covering with suitable material to reduce vibrations. Putty lagging, that is a layer of nondrying putty one inch or more thick covered with varnished material or a similar material to prevent drying, has been found to be a good way of reducing particularly ringing noises and high frequency whistling sounds. Felt-like materials can also be used but they are less effective than putty in combating this type of noise.

Screening consists of the construction of screens or walls, either permanent or portable, made of highly resistant to noise transmission material. Such materials are readily available and rapid strides are being made in their development. Noise abatement is becoming of such great importance in home as well as factory construction that every contractor and building material merchant has had to learn a great deal about it.

Absorption handles directly radiated noises which cannot be screened. The use of sound-absorbing materials on walls, ceiling and floor in such areas where this type of noise occurs is the best step to follow. Felt-like materials have a high sound-absorbing power as have certain porous materials.

Filteration handles direct noise transmitted along ducts or through openings. The high-pass filter in an automobile muffler or the pistol silencer are examples of this method. Space is the usual limitation on such an application.

Forced vibrations from machinery and equipment in the plant can sometimes be cured by isolation through the use of elastic suspension. Spring suspensions, steel, rubber, cork and gelatin compounds are also being used.

A great deal of noise can be reduced or eliminated in many plants by more rigid maintenance policies applied to

even the smallest unit of equipment employed in the plant. Lagging maintenance that permits a machine or equipment maladjustment to go unattended because a critical period has not as yet arrived always means more noise in any plant. Maladjustment on equipment means noise. Sloppy maintenance means noise.

In some instances exterior noises are a problem. Plant management is generally helpless in handling such problems if a neighbor's cooperation cannct be obtained. The only course to pursue here is soundproofing one's building and that in turn means great expense in supplying more lighting and air conditioning in the plant.

However, every bit of progress made in noise abatement or elimination is definite progress and an assurance of that much more increased efficiency and increased production in the plant. It is always a goal worth striving to attain.

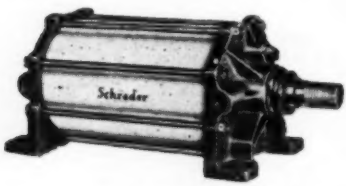
The End

ARE YOU IN ANY ONE OF THESE 3 GROUPS?

- ☐ I have never used compressed air in connection with woodworking.
- ☐ I have made some use of compressed air for woodworking but do not know all of its possibilities.
- ☐ I know nothing about the application of compressed air to woodworking.

If you are in any one of these 3 groups, learn how you can save time and money with compressed air devices, and the increases you can realize in production and safety.

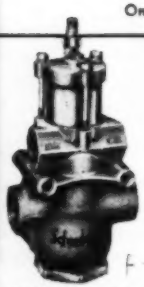
Here are a few of the hundreds of new and improved Schrader Air Control Products. Schrader distributors will gladly show you how you can benefit through their use.



One of Many New Air Cylinders

One of the New Air Clamps

New Hand Lever Valve



Improved pilot valve for remote control—can be timed.

New quick exhaust valve for emptying cylinders rapidly. Speed up cylinder operation.

Air Line Lubricator for automatically lubricating cylinders, chucks, clamps, etc.

Air Pressure Regulator for reducing air pressure and holding it uniform.

Write for complete information and literature on Schrader Air Cylinders, Valves, Air Line Lubricators, etc. If interested in hundreds of other Schrader Products such as Blow Guns, Hose Reels, Air Line Couplers, Press Controls, etc., write for 72-Page Catalog.

Schrader
PRODUCTS CONTROL THE AIR

A. SCHRADER'S SON

302 Vanderbilt Ave., Dept. S-3, Brooklyn 17, N.Y.

Division of Scovill Manufacturing Company, Incorporated

MODERN FURNITURE MAKING AND DESIGN, by Rodney Hooper. The Manual Arts Press, Peoria, Ill. 160 pp. $6.00.

The purpose of this book is to show a variety of treatments for the design and construction of domestic furniture and woodwork. The author has attempted to show a wide range of alternatives, although work of a very advanced technique has been avoided. The book sets out to show the main points of construction in a graphic form with sufficient information for an understanding of design and manufacture.

Divisions of the book include "Furniture for the Living Room," and "Furniture for the Bedroom." Individual chapters cover such subjects as: cabinets, bookcases and tables, clocks, radio cabinets, stools, trays, etc. The section on garden furniture discusses both juvenile and adult furniture.

The book is well written and the illustrations very complete. Many ideas and requisites for good design are described.

MARKING EQUIPMENT

The Industrial Marking Equipment Co., 454 Baltic St., Brooklyn, N.Y. is offering a new catalog showing all types of their equipment. Included are conveyor line marking, carton markers, wooden box markers as well as self-inking numberers.

Use of their products, we are told, will eliminate hand stencilling on average production runs. The brochure is well illustrated, suggested uses and price lists are included.

"SPRAYWAYS"

"Sprayways," a graphic 16-page rotogravure brochure introduced by the DeVilbiss Co., Toledo 1, Ohio, is being distributed to anyone intested in the varied uses of spray painting equipment.

The brochure is a ready reference to many DeVilbiss spray equipment uses and is designed to fit standard file folders.

The DeVilbiss Co., well known in the spray equipment field, has inaugurated the publication to acquaint manufacturers and others with the many new uses for the equipment. Nearly 100 photographs have been incorporated in the publication to graphically display the many spray equipment uses. The photographs are actual scenes taken in industrial plants and in many other places where spray painting equipment is being used.

PROFITABLE AIR POWER

How clean, controlled and lubricated air power proves profitable in the op-

eration of an Indiana Multiple Mortiser. A data sheet giving details of the application of Norgren automatic air controls and oil fog lubrication.

Write for Norgren Blueprint No. 107, C. A. Norgren Co., 237 Santa Fe Drive, Denver 9, Colo.

SHERWIN-WILLIAMS ISSUES BROCHURE ON TV LACQUERS

The Sherwin-Williams Co. has prepared a new technical brochure on its TV lacquers, products especially designed for fine furniture including television and radio cabinets.

The new lacquers are described as a "development in quality finishes that meets new problems and opens new possibilities for finer furniture finishing." They were originally developed to meet severe application requirements which resulted from the growth of the TV receiver industry.

The brochure points out that the TV Lacquers combine these important properties: Water-white . . . non-darkening on exposure to sunlight, or heat; tough and mar-resistant; can be rubbed to a dull, medium or bright lustre—or brought to a high polish; excellent print resistance; highest resistance to cracking from exposure to wide ranges of temperature or moisture content in the wood.

The booklet presents, step-by-step, three commonly used application systems.

This brochure may be obtained upon request from: The Sherwin-Williams Co., General Industrial Division, Cleveland 1, Ohio.

ECONOMY WITH PALLETS

General Box Company of Chicago has a new booklet suggesting three ways that pallet boxes may be used to cut costs in handling, storing, or shipping of material. Together with the story of how design engineering can substantially reduce shipping weight and packing time. A free copy is yours for the asking.

WOOD SCREWS

Twin-fast wood screws are described in a new brochure from the New Process Screw Corporation, Waterville 48, Conn. Enlarged diagrams show details of screw construction and the twin threads which provide a thread pitch claimed to be twice as great as the pitch in ordinary screws.

Suggestions on how to use the screws, number necessary are given. Recommended drill and bit sizes are given in table form.

STEEL STRAPPING

Allegheny "Steelband" strapping, seals, tensioners, sealers, and accessories are illustrated and described in a six-page folder published by Allegheny Steel Band Company, Box 716, Pittsburgh 30, Pa. Allegheny "Steelband" products are used for banding all types of packages, bales, boxes, bundles, and pallets.

CONVERTING TO MILITARY PRODUCTION

One of a series of Defense Production Aids available from the U.S. Department of Commerce for five cents. Order Defense Production Aid No. 11, July 1951.

This four-page leaflet gives a number of peacetime products with the corresponding military products which the manufacturers can make in converting to defense production. This may be helpful in suggesting military products which could be made in your plant. Six recommended steps are listed for proceeding with conversion once a product is decided upon.

Models to suit . . .

EVERY PURSE *and* PURPOSE!

HIGHLIGHTS OF THE JW-250 Shown above:

Extra large tables — solid or sliding section. 43-inch ripping capacity. No build-ups required for working large parts.

Will accommodate saws up to 20" dia. — cut through 6 inches of stock.

Accommodates dado heads up to 4 inches wide.

Equipped with left section sliding table (ball bearing), if desired.

Dust-free, cool-running motor (flat top for greater sawing capacity).

Absolutely accurate tilting mechanism with automatic take-up for wear.

Synchronized brake pedal and push button control. Pressure lubrication, dust arrester, finest gauges, ripping fence and many other outstanding features.

REGARDLESS of the size or nature of your operation or the size of your budget, there's a Tannewitz Tilting Arbor Mitre Saw Bench that will fit your requirements exactly and give you the greatest dollar for dollar value obtainable

In addition to the JW-250 — top model in America's top line of Mitre Saw Benches — there's the others in the "J" series of Mitre Saw Benches: the "J-250" with standard size top, the "JS-250" similar to the "J-250" but having a sliding left section top; the moderately priced "XJ" series with five table variations to promote the maximum of efficiency for each and every production set-up, and the "U" series for those who want tilting arbor mitre saw benches at the lowest price consistent with quality When you buy a mitre saw bench it is wise to get a "TANNEWITZ." For more than 50 years this name has been synonymous with the finest in sawing equipment and recognized as such throughout the nation. Write for bulletins We will be glad to aid you in the selection of the best machine for your particular requirements.

Tannewitz QUALITY

SAWING MACHINERY SPECIALISTS

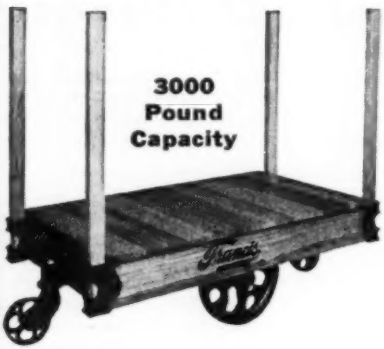
THE TANNEWITZ WORKS

GRAND RAPIDS, MICHIGAN

Immediate Delivery

Francis
EST. 1880
FACTORY-MILL & WAREHOUSE TRUCKS
Cutting Handling Costs since 1880
Buy Direct from the Manufacturer and Save

Need more good trucks quick? Buy direct from the manufacturer and save — time AND money. Francis heavy duty, economical trucks feature strong iron work—hardwood frame—rigid construction. All carefully machine fitted. Steel rims or rubber tires.



Complete Line —
For every use. Standard sizes 27" x 48" and 30" x 54" in stock ready for immediate shipment.

WRITE *TODAY for catalog & prices*

Manufactured by
HOOSIER FENCE CO. Inc.
DEPT.W 1701 E. 38th St., Indianapolis, Ind

ACCIDENT PREVENTION

Practical ways to prevent industrial accidents and fires are contained in the new edition of the National Safety Council's 800-page "Accident Prevention Manual for Industrial Operations."

The book is confined principally to safety in the manufacturing industry, and is based on the premise that a major proportion of all accident causes are common to all industry.

Subjects covered include permanent structure and plant layout; maintenance and maintenance crews; boilers; machine guards; materials-handling hazards; hand and portable power tools; electrical hazards; flammable liquids; fire prevention; fire control; personal protective equipment; industrial health engineering; industrial poisons; medical services in industry; safety organization and training; accident records, analysis and costs. One of the new sections, "The Safety Man's Resources," is a bibliography of safety organizations and publications.

Detailed description and price may be obtained by writing the National Safety Council, 425 North Michigan Avenue, Chicago 11, Ill.

CARBOLOY CUTTING TOOLS

Precision tools you can regrind in your own shop are shown in a new catalog by the Redco Tool Division, Red Lion Cabinet Co., Red Lion, Pa. These include saws, router bits and cutter heads.

Each type of head is illustrated, uses described and a table of specifications and prices included. Treatment of saws and bits follows the same outline. A profile grinder for making special high speed steel or cembented carbide knives for use on shapers, moulders and other similar equipment is also included in this catalog. The Company has a Redco grinder which can be used to resharpen the tools this firm produces.

SELECTIVE PATTERN STAPLING CLEATERS

A new bulletin, No. 167-DS, illustrating several sizes of cleat stapling machines has been released by Saranac Machine Company, Benton Harbor, Michigan.

Designed to staple crate sections in any pattern, simple or complex, the machines are also adjustable for fastening any number of cleats and slats. In one stroke of the driving heads, the units manufacture, drive and clinch their own staples directly from wire coils of standard gauges.

In the bulletin, machines of 40", 52" and 70" capacities are described. Models for stapling crate bases and pallets are also shown, including the chain feed Saranac UH machine. Reeves varispeed drives, magnetic clutches, floor switches and magnetic controls are among the mechanical features offered. With 3 or 4 persons, production of the hand feed models is said to be up to 600 crate sections per hour.

PLYWOOD BUYING GUIDE

A 12-page "Plywood Buying Guide Catalog" is available from Aetna Plywood & Veneer Company.

The catalog shows many plywood installations and products. A whole page is devoted to Parkwood plastic laminates. An oval conference table, utilizing sliced walnut Parkwood Genuwood is the center of attraction.

This Teleply Ticker No. 535, is offered free to those writing on their company stationery. Write Aetna Plywood & Veneer Company, 1737 North Elston, Chicago 22, Illinois.

No war, no strike, no depression, can so completely destroy an established business or its profits, as new and better methods, equipment and materials in the hands of an enlightened competitor.

DEDGIE—the Planer Boss Says:—

"Hallowe'en isn't the only night a lot of Pumpkin Heads get lit up!"

Maybe — but our good customers are shrewd buyers who light up with a smile when they find out the fast cutting and high production of

DETROIT KNIVES

PLANER—MOULDER

VENEER—CLIPPER

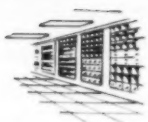
SHAPER STEEL

Try DETROIT knives for yourself and you'll find out why leading mills throughout the country use them. Say DETROIT to your dealer.

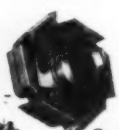
Better knives since 1885

DETROIT EDGE TOOL CO.
6570 E. NEVADA
DETROIT 34, MICHIGAN

Off the drawing board



or off the shelf



Diehl Vice-Grip, Round and Square Heads, Tongue and Groove Knives as well as thick and thin knives are available from stock in a complete range of standard models and sizes.

Diehl can design and build special heads and cutters to solve unusual problems. Diehl's engineering department is always at your service.

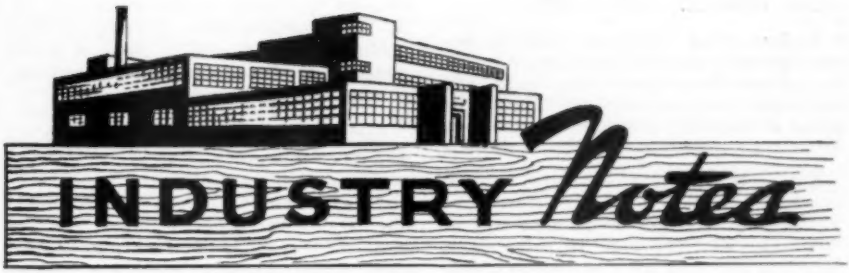
Write or call about your cutter needs—you can depend on recommendations of DIEHL—Makers of THE DEPENDABLE LINE.

CUTTER DIVISION

On the Banks of the Wabash

THE G.M. **Diehl** MACHINE WORKS, INC.

WABASH, INDIANA • U.S.A.



N.H.L.A. HOLDS 54TH ANNUAL MEET

The National Hardwood Lumber Association held its 4-day meeting at Chicago in September. Registration neared the 1600 mark for an all-time high.

Lee Robinson of Mt. Vernon, Ala., was re-elected president. James C. Walsh of Chicago and Harry Gaines of St. Louis with T. M. Millett of Louisville were re-elected vice-presidents. New directors chosen included: W. Howard Walker of McMinnville, Tenn., and J. B. Morgan, of Toronto, Ontario. Past President Frank W. Hutcheson automatically becomes a member of the board of directors.

Among directors re-elected for 1954 were: Al. H. Bankston, George Dannereau, Kerry L. Emmons, B. O. Gerrish, H. E. Gill, Franklin T. Griffin, H. A. Hanlon, O. B. Hayes, Harry E. Kline, Daniel H. Sanders, Fred S. Underhill and John B. Veach.

John W. McClure, who will be resigning as secretary-manager sometime before January 1, will also become a director-at-large because he is a past president of the association. Mr. McClure expects to take up residence in Memphis, Tenn.

POWER TOOL ASSOCIATION

Representatives of manufacturers of power tools met at Washington in August to form the Power Tool Manufacturers' Association. Ten charter members are: Atlas Press Co., Boice-Crane Co., Central Specialty Div., King-Seeley Corp., Double A Products Co., Delta Power Tool Div., Rockwell Mfg. Co., Duro Metal Products Co., Logan Engineering Co., Magna Engineering Co., Famco Machine Co. and Walker-Turner Div., Kearney & Trecker Corp.

Elected to head the new association are: president, Myron H. Buehrer, vice president and general manager of the Boice-Crane Co., Toledo, Ohio; vice president, Herbert Upton, president of Double A Products Co., Manchester, Mich. Shopmaster, Inc., Minneapolis, and Emerson Electric Mfg. Co., St. Louis, have since become members.

The organization has already recommended to NPA the appointment of an industry advisory committee so that problems facing this industry could be quickly solved. NPA has appointed such a committee. Association activities will be outlined at a future meeting.

N.A.H.B. CONVENTION

The eighth annual convention and exposition of the National Association of Home Builders will be held in Chicago, January 20-24, in the Stevens and Congress Hotels.

The builders' conclave is expected to attract a record turn-out in view of the many problems facing the building industry and the boom in association membership. More than 6,000 new members have joined the association since the 1951 convention.

GLUE COMPANY EXPANDS

Perkins Glue Company recently began operations at its Shawano, Wisconsin distribution point for bulk and packaged wood glues of all types. The plant is centrally located for servicing large resin glue users in the Mid-west.

E. Morris Jones, Perkins district representative in Wisconsin for thirty-one years, is in charge of the new operation. He will continue to maintain a business office in the Plankinton building, Milwaukee, Wisconsin. He is assisted by his son, Jack B. Jones, who is also well-known in the plywood industry.

BUYS LINE FROM AMERICAN SAW MILL

American Machine and Foundry Company's radial arm saw manufacturing subsidiary, DeWalt Inc. of Lancaster, Pa., has purchased the complete "Monarch" woodworking machinery line of the American Saw Mill Machinery Company of Hackettstown, N. J. The products taken over by DeWalt include a large radial saw, a small radial saw, planer, bench saw, mortiser, jointer and band saw.

Included in the transaction were all stocks of inventory applying to American Saw Mill's woodworking machinery line and the "Monarch" trade name identifying the product range. No disposition was made by the Hackettstown firm of its sawmill machinery line or of its plant, machinery and equipment.

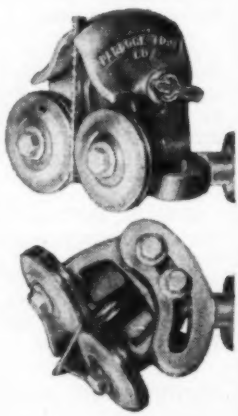
MOVE TO NEW PLANT

The C. A. Norgren Company plans to move from its present location at 222 Santa Fe Drive, Denver, Colo., to its new, modern plant in Englewood, Colo., about November 17. The Norgren firm has consolidated its two-week moving date with its annual employees' vacation period. Orders will be accepted

MORE SPEED MORE SUPPORT MORE WORK

MAKES BAND-SAWS CUT AT ANGLE UP TO 45%

PADDOCK BALL-BEARING BAND-SAW GUIDES (MODEL 20) enables a 36" machine to cut material 22" wide at an angle up to 45%. Guides are quickly adjusted to width, thickness, and blade angle. The lower unit pictured at right shows angular adjustment. Note the interchangeable ball-bearing wheel action. Turning with the blade, the wheels hold the working portion of the blade as in a frame — for faster cutting, less blade breakage, and cutting more materials. Install inexpensive PADDOCK GUIDES and you save money as well as make old or new band saws cut more efficiently. Write for prices and details on PADDOCK GUIDES — today!



PADDOCK TOOL COMPANY

Guide Makers Since 1920

1418 WALNUT ST. KANSAS CITY, MO.

Paddock BALL-BEARING BAND SAW GUIDES

during that time, but no production operations will be carried on and no shipments made.

The new Englewood plant is more than two and a half times the size of the Sante Fe drive plant and will include many new units of production and materials handling equipment. The attractive red Boulder sandstone structure will overlook the historic Santa Fe trail and will present an interesting panorama of the Rocky Mountain range.

The Norgren firm manufactures pneumatic products, including oil fog lubricators, air filters, pressure regulators, relief valves and other air controls, hose couplings and hose assemblies.

GOODSPEED CENTENNIAL

With the close of 1951, the Goodspeed Machine Company, Winchendon, Mass., marks a full century of progress in the development and manufacture of woodworking machinery. Goodspeed's line of woodworking machinery originated in 1851 when George N. Goodspeed and Mr. Wyman began the manufacture of planers, dowel machines, pail and tub machinery, sawing and boring machines, chair machinery, spool and bobin machines and back knife gauge lathes. At one time the company also built turret type, hand operated, metal screw machines and sewing machines.

The business operated for many years as a partnership—Goodspeed and Wyman. Then the company ran under the name of G. N. Goodspeed's until 1900. For twenty years after this the organization was a six-man partnership, assuming its present title—Goodspeed Machine Company. In 1918 the present owners took over until the company was incorporated under the laws of Massachusetts in 1925.

The firm now manufactures the following machinery: double surface cabinet planers. single surfacers, double surfacers, spindle shapers, wood heel shapers, automatic variety lathes, auto-

5 BASIC UNITS IN 1 PLURALITY

OILSTONE GRINDERS

With one Mummert-Dixon Plurality Oilstone Grinder you get (1) Coarse Oilstone Wheel, (2) Fine Oilstone Wheel, (3) Grinding Cone, (4) Leather Stropping Wheel and (5) General Grinding Wheel. Made in 3 sizes to meet every grinding and sharpening requirement in woodworking plants. Designed for hard and long usage. Efficient. Easily accessible. Investigate Mummert-Dixon equipment now. Send for informative literature today. No obligation.

MUMMERT-DIXON CO.

124 Philadelphia St., Hanover, Pennsylvania

matic turning lathes and hand operated variety lathes, back knife gauge lathes, double saw cut-off, chucking and multiple boring machines, as well as hand jointers and dowel machinery. They also build: box board edgers and matchers, box board press and sizers and a trimming saw, pail and tub machinery, clothespin lathes and slotters, spool and bobbin lathes and chucking machinery .

ASSOCIATION OF MANUFACTURERS OF WOODWORKING MACHINERY

A large representation of member companies of the Association of Manufacturers of Woodworking Machinery met September 20 in Chicago to discuss current problems arising from the defense program.

Representing the NPA, Washington, D.C., Roy Peterson, chief of the woodworking machinery section, spoke on the Controlled Materials Plan. Association president, Ray C. DuBrucq of the Crescent Machine Div., Rockwell Mfg. Co., presided at the meetings and presented first-hand information on "What is Going on in Washington?" Mr. DuBrucq is representing his company in Washington in connection with government controls.

"The Effects of the Defense Program" was the subject of an interesting talk by M. D. Baldwin, president of the Oliver Machinery Company who presented specific instances illustrating the manner in which his company has been affected by government controls.

Other speeches covered incentive pay systems and future plans of the association.

U. S. PLYWOOD TAKES OVER PANAMA FOREST PRODUCTS CORP.

United States Plywood Corporation announced recently that it has taken

HS Milled to Pattern Knives ★
★ UNIFORMLY HEAT TREATED TO PRECISION HARDNESS IN SALT BATH
ALL TYPES AND SHAPES • SUPERIOR WORKMANSHIP • BEST TUNGSTEN STEEL
"Try our New Methods on your Worst Problems"
Virginia Machine Tool Co.
BASSETT, VIRGINIA

over the management of the Panama Forest Products Corporation located in Panama City, Panama.

Clifford P. Setter, vice president in charge of production, said that United States Plywood also has an option extending for a period of years for the purchase of a 50% interest in the Panama company.

"We have had a number of our technicians studying the Panama timbers for a period of time, and we are of the opinion," Mr. Setter said, "that in addition to true mahogany, secondary woods found in Panama are equal to the best timber available in any part of the tropics or from Africa."

United States Plywood intends to develop this timber as a source of supply for raw materials required by some of its domenstic plants. This will also provide termite-resistant plywood for distribution throughout Central and South America as well as in the southern parts of the United States, he said.

Included in the operating equipment of the Panama company is a lumber mill and a veneer slicer. The plant is in operation at the present time, and a 35,000-square foot addition is now being built. Management of the Panama operation will be under Willis E. Parnell, former chemical engineer and assistant chief of production at Algoma, Wisconsin plant of United States Plywood Corporation.

FRANCIS H. SNYDER

Mr. Francis H. Snyder, president of Snyder Chemical Corporation, Bethel, Connecticut, announces his resignation as active head of the firm.

Mr. Snyder, who is prominent in the field of chemical development, requested his release in order to enable him to devote his full energies to his consulting practice in chemical research, presently located at Newtown, Connecticut. His connection with Snyder Chemical Corporation will be maintained in a consulting capacity.

Master Mind of The Moore Cross-Circulation Drying System

Let the Moore Master Recorder-Controller take the "guess" out of lumber drying, and place it under scientific control. This single instrument contains four separate dryer controls: ★ Automatically controls roof ventilators, conserving steam and fuel — ★ Automatically controls and records temperatures at each end of kiln independently — ★ Automatically controls and records humidity inside kiln.

Get The Facts, and You'll Get a Moore Cross-Circulation Kiln

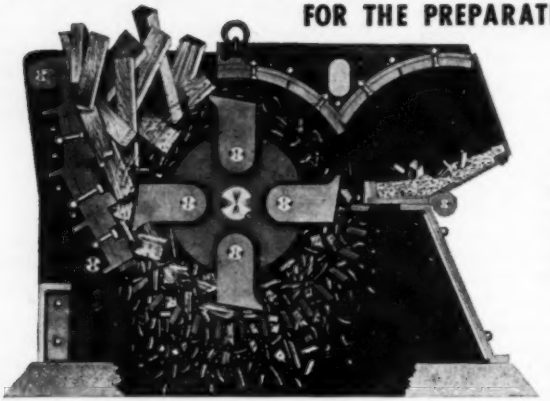
MOORE DRY KILN COMPANY

Oldest and Largest Manufacturers of Dry Kilns and Veneer Dryers

JACKSONVILLE FLORIDA · BRAMPTON ONT CANADA · VANCOUVER B C CANADA · NORTH PORTLAND OREGON

WILLIAMS "NO-NIFE" HOGS

FOR THE PREPARATION OF WOOD REFUSE FOR BOILER FUEL



Sectional drawing of Williams "No-Nife" Hog showing how the fast revolving hammers cut the wood refuse by impact.

Williams new and improved "No-Nife" Hogs are now offered for use in all wood working plants. Experience has proven, that when properly handled, wood refuse is the cheapest fuel for all wood working plants. Therefore, the wood refuse utilized in this manner not only insures a proper fuel supply, but also provides a convenient and economical method of cleaning the refuse from the mill and disposing of it without additional expense.

Hog fuel as made with the improved "No-Nife" Hog.

ALSO USED FOR REDUCING WET OR DRY VENEER AND PLYWOOD SCRAP

The Williams "No-Nife" Hog will reduce wet or dry Veneer and Plywood Scrap to a uniform size wth no long slivers or big pieces—thus the finished product can easily be handled in pneumatic air lines. No need to worry about elbows of your system becoming clogged. Hundreds of satisfied users attest to their dependability.

WC81-2

CHECK ✓ THESE FEATURES

- Many sizes of "No-Nife" Hogs to choose from.
- Adjustments to overcome wear.
- Larger feed opening.
- Hinged cover—instant accessibility.
- No knives to sharpen or be damaged by tramp iron.

WILLIAMS ALSO MAKES...

Hogs and Shredders for making wood flour and sawdust. Vibrating Screens and Air Separators to work in closed circuit with our Shredders for absolute control of product size.

Williams Patent Crusher & Pulverizer Co.

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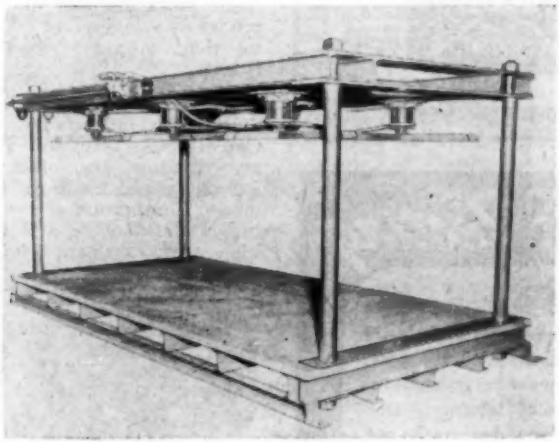
WILLIAMS

CRUSHERS GRINDERS SHREDDERS

EQUIPMENT and Supplies for the WOODWORKING INDUSTRY

FLUSH DOOR ASSEMBLY PRESS



The Union Tool Corporation, Warsaw, Indiana, has designed and is now in production on a new inexpensive flush door assembly press. This new Union press is made specifically to meet small production requirements in assembling veneer panels to hollow core frames. The top platen is pneumatically operated and provides positive sustained pressure throughout the glue-setting period.

The new press is available in dimensions to meet your requirements. Distribution will be handled by company agents throughout the United States.

The Union Tool Corporation manufactures complete lines of standard wood gluing machinery. The company also designs and makes machines to meet any special application.

PAINT STABILIZERS

The Borden Company's Chemical Division has developed six new "stabi-

MARCOLOY
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MARCOLOY
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Testing glued wood products to meet the requirements of industry and Government specifications for strength and moisture resistance is one of the many laboratory services we perform for small and large firms.

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WD

lizers" for latex paints. These are solutions which "stabilize" the paint's emulsion. They account for 10-25 percent of the paint's total weight.

Quick drying and virtually odorless, latex paints can be applied easily with either brush or roller. They leave no brush or lap marks, even if work is resumed on a partly painted surface several hours later. The tough latex paint film permits removal of grease or other stains without a smudge.

This new type of paint will cover practically any type of surface—wood, plaster or wallpaper—without an undercoat. In addition, the paints are easy to make, requiring only simple, cold mixing and blending.

The latex paint family derives its name from the fact that the principle binder is a latex-like emulsion, similar to that used in making synthetic rubber.

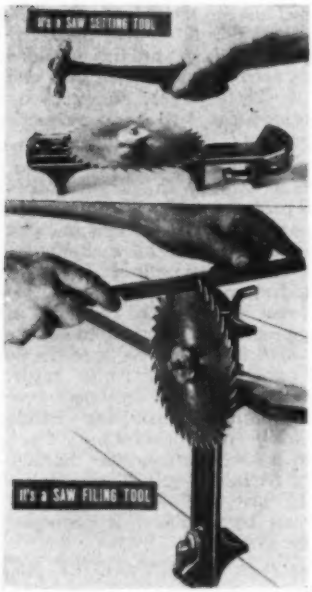
The six Borden stabilizers are marketed under the trade names Cascola, Cascolac and Protovac. Two are powders, the others are liquids. Advantages of the Borden products include: Elimination of heating and mixing preparations and storage problems, high water resistance, improved resistance to freezing, more brilliant color and easier brushing.

Additional information on all six of the new stabilizers is available from the Chemical Division of the Borden Company, 350 Madison Avenue, New York 17, N. Y.

FILING AND SETTING TOOL

A new tool for setting and filing the teeth of circular saw blades is announced by Clark & Sawyer, Inc., 600 Mateo Street, Los Angeles 21, California. This combination is used to keep circular saw blades in efficient cutting condition. It is adjustable for blade diameters from 6" to 18" and accommodates all standard size and shape arbors.

At one end there is a tool steel



"hammer and anvil" matched at 15 degrees to give the saw blade the proper set. The other end has a tension bar for filing the teeth under proper tension. A built-in clamping device for convenient fastening in a vertical position is available when the Sharp-Set is used for saw filing.

RADIAL ARM DRILLS

Ekstrom, Carlson & Co., Dept. W-9, 1400 Railroad Avenue, Rockford, Illinois have reinstated their No. 30 (30") and No. 71 (71") radial arm drills to their line of production equipment for the aircraft industry. First offered to industry during World War II, these units were designed for fast, light drilling and are adaptable for both single piece and production runs with equal efficiency. Available again are four types of each of the two sizes.

Type A employs a large nut for mounting the complete unit on a table

BEVEL RIPPING . . .
ONE OF OVER 1000
WILSON OPERATIONS

A WILSON IS YOUR BEST INVESTMENT

WILSON
RADIAL CUTTING MACHINE

MAKE YOUR "PILE OF STOCK"
Pay EXTRA Dividends with a
STURDY, SPEEDY, ACCURATE
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For further information write to

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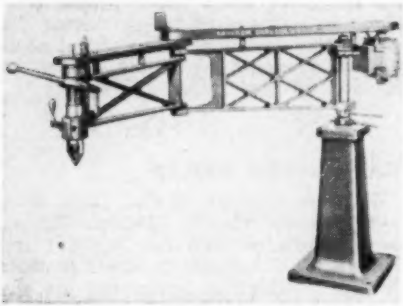
Est. 1922

or stand. Intended for use at a fixed height only, no provision has been made for vertical adjustment.



Type B embodies a threaded post and support bracket for mounting unit on a table or stand, but this unit can be vertically adjusted up to six inches.

Type C is identical in construction to Type B except that it comes equipped with its own cast iron base. All of the above types have an inner spindle assembly which slides within an outer sleeve. This outer sleeve is fitted with the desired diameter drill bushing. Locating the spindle and the actual drilling are accomplished with one and the same lever; however, an extra handle is provided for two-handed operation, if necessary.

Type D radial arm drills can be furnished in any of the three aforementioned mountings. It differs from Types A, B, and C in that there is no outer sleeve and inner spindle assembly. Instead, the entire spindle assembly is actuated manually with a four-spoke hand lever by means of rack and pinion arrangement. An adjustable coil spring is provided to counterbalance the downstroke and facilitate rapid return of the drill spindle to an "up" position. A side-mounted auxiliary handle is used only for positioning the drill spindle prior to the actual drilling operation. Standard spindle speeds for the Type D are 2500 and 4000 rpm; but these can be modified, if necessary, to suit the customer.

All models, except the ECCO No. 30D

HOSE FOR EXHAUSTING
SAWDUST • SHAVINGS • CHIPS, ETC.

FLEXAUST . . .

SPIRAL-REINFORCED HOSE, LIGHT, STRONG & VERY FLEXIBLE

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EXTREMELY EASY TO INSTALL — EFFICIENT AND ECONOMICAL IN USE

SIZES 1¼" to 28" dia. Various Flexaust types, accessories, and other hose types available.

BLOFEX — Non-reinforced collapsible hose
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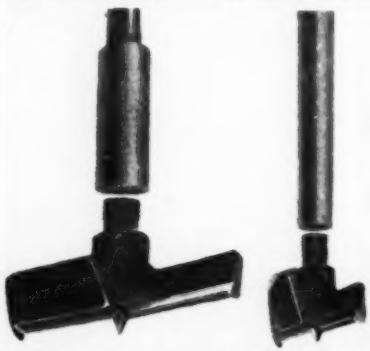
PLANETOR CHIP FLOW MACHINE BITS

Supreme in smoothness, speed, endurance



STOCK SIZES: 1" to 4" by 16ths. 4⅛" to 6" by 8ths on special order.

Dealers in Principal Cities

PRICE & RUTZEBECK
BOX 30 HAYWARD, CALIF.

and the No. 71D radial arm drills can be supplied with a gravity-feed drill lubricating system for fast drilling in metals.

NEWEST GUILD SANDER INTRODUCED

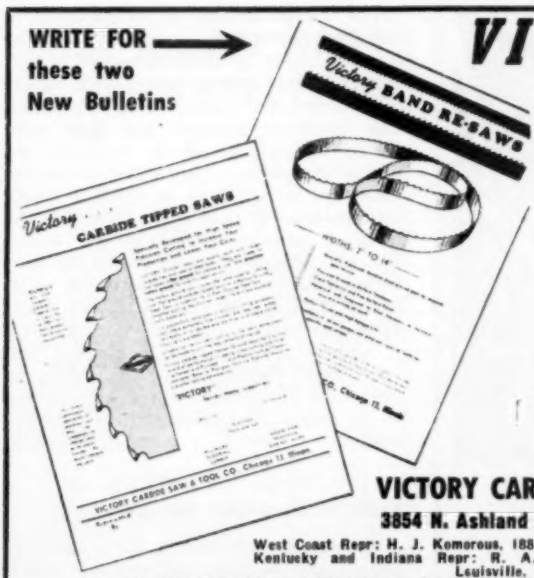
Cabinet makers, furniture manufacturers, millwork shops, boat builders and factory maintenance men can reduce their hand sanding by 90% with the model 106 finishing sander, says the Porter-Cable Company, Dept. PR-1, Syracuse 8, N. Y.

The abrasive pad of this sander revolves in a ¼" diameter orbit at 4000 rpm. The thousands of abrasive grits, traveling in tiny overlapping circles, produce a uniform smoothing action. Because of this orbital motion, the machine can sand with, against and across the grain without scratch or mar. This bending action is particularly effective wherever cross-grains meet—at butt, miter and glued joints, for example.

Model 106 provides comfortable operation because the machine weighs only six pounds. We are told that it is

well balanced and that fatigue is cut to a minimum even when sanding vertical surfaces. The sander is 9½" long,

WRITE FOR these two New Bulletins



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Give yourself a treat next time you head for St Louis — make your reservation at Hotel Claridge . . it will be a tonic en-route when you think of the nice hot shower you will enjoy after a busy day and the grand night's sleep in one of the softest beds you ever dreamed of Come for vacation — for business or pleasure . . but first of all be sure to stay at the Claridge.
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PLENTY OF PARKING SPACE
350 ROOMS
FROM $2.75
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LOCUST AT EIGHTEENTH
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MISSOURI

4⅛" wide and 6½" high. A shaped handle and convenient trigger switch are other features.

UNICEL TRUCK-TRAILER

A new and revolutionary refrigerator truck-trailer made of cellular plastic-laminated plywood and called the Unicel was introduced to a group of the nation's top trucking, shipping and government executives in Chicago recently. The new vehicle, first non-metal truck-trailer to be built with the strength of steel, was designed and built by the Pressed Steel Car Company, Inc., of Chicago, to specifications furnished by the Brown Equipment & Manufacturing Company.

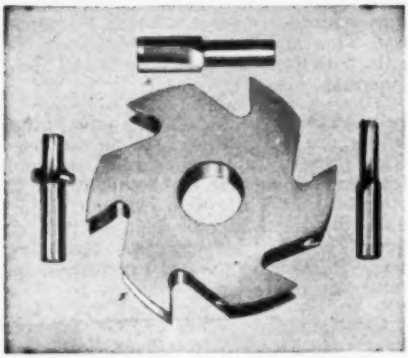
Alongside the streamlined, red-aluminum-and black trailer, an eye-catching exhibit graphically told visitors the advantages and highlight features of the Unicel compared to conventional refrigerator truck-trailers made of metal.

The Unicel trailer is constructed of cellular laminates, a relatively new material made by laminating strong plywoods grain-against-grain with specially formulated super-strength plastics. The laminate sections are then subjected to high-frequency heat applied under tremendous electronic pressures molding the sections to form a single unit-cellular structure (from which the finished structure derives its name, Unicel). The only steel used in the construction of the Unicel trailer is in its heavy duty tandem and kingpin wear-plate assembly and the door-frames. A company spokesman estimated that 200 tons of metal could be saved on an order for 100 Unicel trailers compared to an order for 100 conventional metal trailers.

VERTICAL BAND RESAW

Several improvements have recently been made in their 54" vertical resaw according to the manufacturer, Mc-

Sterling Quality Woodworking TOOLS



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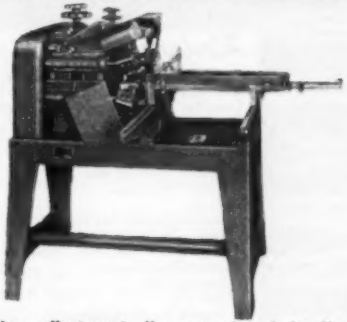
DELUXE FLOOR MODEL TENONER



New adjustment allows exact and simultaneous adjustment of tenon spindles.
3 H.P. Motor.
3 Inch Blades
V Belt pulley drive on both tenon and cope spindles.
Heavier Construction for greater accuracy.

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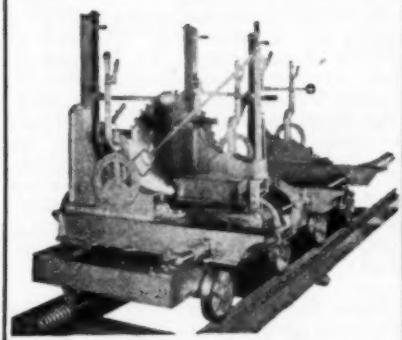

THE ENTERPRISE COMPANY
SUBSIDIARY OF WM. K. STAMETS COMPANY
MACHINERY BUILDERS & ENGINEERS
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LIFT TRUCK JACK & PLATFORM

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Reduce Costs by assembling your products easier and stronger with "Rockford" Quality Controlled Threaded Fasteners.
We manufacture a complete line.
Cap and Set Screws
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• Made in Slotted or "Rockford-Phillips" Heads
"Quality Controlled Products"
"ROCKFORD" Screw Products Co.
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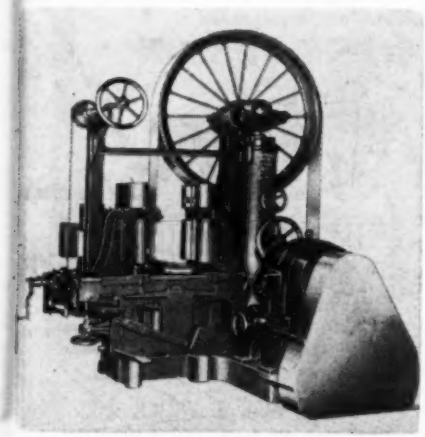
Donough Manufacturing Company of Eau Claire, Wisconsin.

These improvements include a new type transmission for the feed rolls.



This new transmission is a positive gear drive with five speeds ranging from 40 to 220 lineal feet per minute through the feed rollers. All of the gears, which are hardened cut steel, remain in mesh and the speed change is made by simple lever control. Anti-friction needle bearings with oil seals are provided throughout. This transmission is interchangeable with previous drives used on McDonough resaws.

In addition the gears and feed roller shafts are now treated by an electrofilm process that deposits a graphite film in the surface of the metal. It is claimed that while this does not eliminate the need for lubrication, it does avoid galling, scoring and excessive wear should the normal lubrication be faulty or neglected.

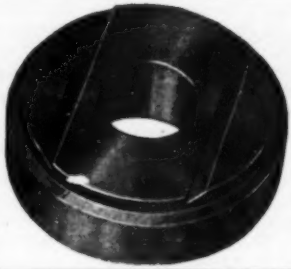
Other improvements include Timken bearings on the lower wheel shaft and hardened cut steel mitre drive gears on the feed rollers. These are also equipped with Timken bearings.

A.S.M.E. MEETING

The American Society of Mechanical Engineers—Wood Industries Division—will hold its annual meeting in Atlantic City, New Jersey, November 26. Two sessions will be held.

At the morning session the following papers will be presented: "Elements of Circular Saw Design," by Norman C. Bye, director of engineering, Henry Disston & Sons, Inc., Philadelphia, Pa.; "Woodworking Machinery Manufacturers Look at Carbide Tool Cutting," by Ray C. DuBrucq, president, Association of Manufacturers of Woodworking Machinery; "Comparative Costs of Carbide Tipped Saws," by Claude E. Drake, president, Drake Corporation, St. Louis, Mo.

These papers will be read during the afternoon session: "Profitable By-products from Wood Manufacturing Waste," by Paul H. Graham; "Economics of Hardwood Manufacture," by Armin Elmendorf, president, Elmendorf Research; "Principles of Chair Frame Design," by Aubrey Dunbar, general superintendent, Tomlinson of High Point.



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Friction between collar and pattern entirely eliminated — no more burning.

Outer rim is independent of the slotted collar and revolves with the feed of the work.

Collars can also be supplied without grooves for use with solid steel cutters.

Give diameter of collar and size of hole.

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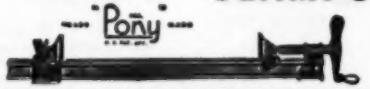
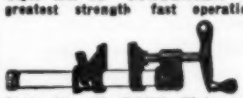
"Jorgensen" CLAMPS
"Pony"



Style No. 70 "JORGENSEN" I-bar Clamps for greatest strength fast operation, and economy.



Style No. 50 PONY Fixtures make ideal bar clamps on black pipe — any length.

"JORGENSEN" "C" clamps are built to take hard service, at low cost.

Genuine "JORGENSEN" Handscrews — hard maple jaws, steel spindles. You can depend on them.

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Offers an exceptionally fine line of carboloy tipped corner rounders. Free cutting, long-lasting. (Records of 85,000 linear feet of fine finish work.)

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See these and the KWIK-KUT line of carboloy tipped router bits at your stocking dealers:

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CYCLONE Installation of twin set of Cyclone Dust Collectors on boiler house roof of modern woodworking plant.
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When you install a Cyclone System of Dust Collection in your plant, you can be sure the equipment is designed, engineered and placed in operation . . . to meet your specific needs. Here at Cyclone we have qualified and experienced personnel to help solve your dust control problems. Contact us for engineering survey with a view to increasing your output and saving you money. No obligation.

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LAMINATED SHOE LAST

Study of construction of laminated shoe lasts from bonded wood is underway in a new research project at State University of New York, College of Forestry, Syracuse. A contract for the study has been awarded the college by the Office of the Quartermaster General, U. S. Department of the Army, announces Dr. Edwin C. Jahn, director of research at the college.

"Use of bonded wood in shoe lasts is expected to eliminate the long seasoning process now required in last-making," Dr. Jahn explained. A seasoning period of nine months to one year is needed in present methods, he pointed out, while wood for bonded lasts can be kiln-dried in two to three weeks.

"Laminating lasts will also eliminate waste and make it possible to secure better utilization of the nation's wood resources," he said. Laminated lasts made experimentally at the college use less wood than billets (wooden blocks) now used in making lasts.

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STOP DUST

DUSTKOPS **20 Models**
UNIT TYPE 300 to 3600 cfm
LOW COST ¼ hp to 5 hp

AVAILABLE FROM STOCK

For: Grinders, buffers, polishers, woodworking, lint . . . All Dusts.

Send for Cat. 605a; describe problem.

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for Swing Saws
SAVES $30 to $50 A MONTH IN LUMBER AND LABOR
30 Days Free Trial
ORDER NOW OR SEND FOR CIRCULAR
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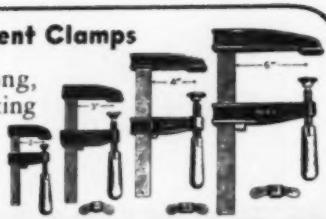
HARTFORD CLAMPS
Since 1915

Deep Engagement Clamps

Designed for long, hard usage. Locking device locks instantly; will not slip or stick.



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UNIFORMITY OF SASH PATTERN IS YOURS... INDEFINITELY

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SHIMER SASH HEADS

WITH LONG-LIFE CIRCULAR BITS

You can produce and reproduce sash moulding patterns without a variation . . . clearance protected Shimer circular bits hold their shape indefinitely! They're quick, easy to sharpen, designed for all-around clearance cut! Long runs or short—cut your sash mouldings the economical Shimer way and pocket extra profits!

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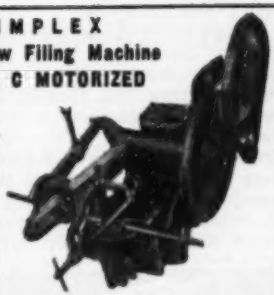
Band Saw Filing Machine

MODEL C MOTORIZED



The Simplest machine of its kind made, works automatically and requires no attention after being started. Files old saws with uneven teeth as perfectly as new saws, teeth being filed evenly and to a uniform height.

All movable parts are operated by but **one shaft** — everything **simple, durable** and **dependable.**

Self-opening Vise and new improved slide and bearing. Solid construction — no vibration.

Requires but a few moments to adjust the saw and the machine.

Will take in band saws ⅛"—1¼" in width with spacings from $\frac{1}{16}$"—$\frac{5}{16}$", point to point.

Uses ordinary 6" taper saw files.

Plug Into Any Electric Light Socket

Equipped with heavy duty ¾ H.P. single phase A.C. 60 cycle 110 volt ball bearing ventilated open type motor. Driven by two V belts.

Cord, plug and switch supplied as standard equipment.

FURTHER DETAILS UPON REQUEST

ZEILLER & NAGEL INC.

232 JAVA BROOKLYN 22, N. Y.

44" vertical band resaw

WRITE

McDONOUGH MANUFACTURING CO.

Incorporated 1888

EAU CLAIRE, WISCONSIN

"World's Largest Producer of Band Resaws"

MILWAUKEE WROT WASHERS

SINCE 1887

WASHERS - BLANKS STAMPINGS

Your most dependable source of supply—the world's largest manufacturer of Washers, serving Industry since 1887. Over 22,000 sets of Dies.

Submit your blueprints and quantity requirements for estimates.

WROUGHT WASHER MFG. CO.

The World's Largest Producer of Washers

2261 S. Bay Street Milwaukee 7, Wis.

AIR COMPRESSORS

Announcement has been made by the Quincy Compressor Co., Quincy, Ill., of a new twelve-page catalog, Form 300, featuring the Quincy line of air compressors specifically designed for industrial service. This catalog, designed in two colors, presents a complete study, by means of illustrations, drawings and specifications of the 35 air-cooled Quincy compressors generally recommended for industrial use.

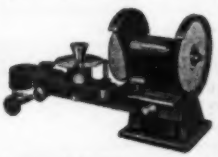
The district attorney was questioning a Kentucky colonel in court. Unable to shake his testimony, he tried sarcasm.

"They call you colonel," he sneered. "In what regiment are you a colonel?"

"Well," drawled the colonel, "it's like this. The 'colonel' in front of my name is like the 'honorable' in front of yours. It doesn't mean a thing."

CUT
SAW MAINTENANCE
COSTS!

with the
REYNOLDS
CIRCULAR SAW
GRINDER
for



rip, cut-off, and combination saws
(5" to 30" diameter)

Produces top quality results in fraction of time usually necessary for sharpening, jointing, gumming and tooth forming. Any hook or pitch of tooth and depth of cut is quickly adjusted. Both hands are free to control position of saw while grinding.

WRITE NOW FOR FREE CIRCULAR!

PROVIDENCE SAW & KNIFE CO.
Dept. WD 303 Eddy St. Providence 3, R.I.

DIAMOND WHEELS

Write for catalog and name of distributor nearest you

Manufactured by
UNITED STATES DIAMOND WHEEL CO. AURORA ILLINOIS

SAVE MONEY ON SANDING OPERATIONS

by using our GRAPHITE COATED CANVAS. This acts as a lubricant, reducing friction against back of sanding belts, increasing their life and speeding up operations. Used on endless belt, edge, chairback sanders and handblocks. $6.50 per yard 35½" width, $1.20 per yard 6" wide, f.o.b. Crystal Lake. Other widths proportionate cost. **Export shipments 10% additional. EXTRA HEAVY Graphite Coated BELTING available at $10.75 per yard, in 36" width.**

PROCESS ENGINEERING CORP. 729 Virginia Avenue Crystal Lake, Illinois

TRY IT FREE

CLEANS - FAST - SAFE AND AT LESS COST!

Cleans motors, planers, all machines fast. Prevents over heating and reduces fire hazards. Four handy models operate from any socket. Write for details and

ACE
Portable Electric BLOWER

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THE ACE CO.
122 W. Washington St. Ocala, Fla.

Better-Built Trucks by TOWSLEY

give better service, last longer, cost less in the long run.

Phone, wire, or write for quotations!

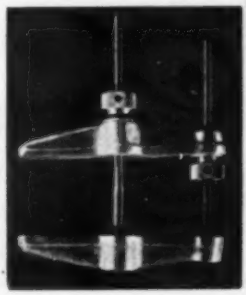
TOWSLEY TRUCKS, INC.
1760 Elmore St. Cincinnati 23, O.

Monarch
VISE ACTION CLAMP
FOR
Toolmakers - Inspectors - General Machine Work
Woodworkers - Fabricators

• Fast - Positive - Lightweight • Tough Aluminum Alloy Jaws
• Capacity to 4½ inches
Grips The Work Straight - Like A Vise - Without Side Slipping

One of the most efficient clamps ever devised for Strength, Holding Power, Capacity, Quick and Easy Operation. Try them, you'll want more—low price. **$3.50** per clamp

Dealers Desired



C. B. TEETER— *Tool Room Specialties*
4470 Oakenwald Ave. Chicago 15, Ill.

NEW FIRM

The newly established firm of Fjellman & Winther, Joliet, Illinois, is offering the famed Fjellman hydraulic press to the American woodworking industry. This plywood and veneer press has long been used in Europe.

President of the firm is Kaj I. Winther who will direct activities as the American merchandising and servicing affiliate of the Swedish parent firm. Mr. Winther, a native of Denmark, has been associated with the woodworking industry for many years both in Europe and America. He spent some time in the U. S. during the thirties, then returned to Denmark shortly before the outbreak of World War II. He was active in the Danish Underground during the Nazi occupation.

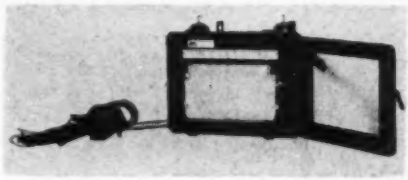
Following the close of the war, he and his family moved to the United States to establish permanent residence and apply for citizenship. He helped found the V. Berthelsen Engineering Works, Inc., of Joliet and until recently was its general manager.

The new company has offices at 312 Henderson Ave. The firm has a free engineering consultation service and a complete service and repair department. The Fjellman presses are now available from this concern in all models.

Why should anyone care what side his bread is buttered on? He eats both sides anyway.

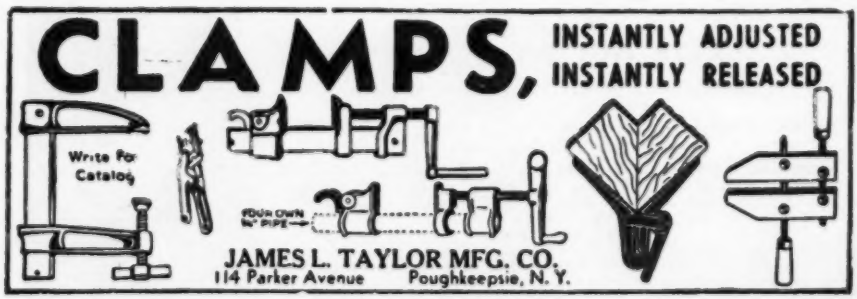
CHECK CURRENT CONSUMPTION

A new, trouble-shooting combination, the TAG recording ammeter used portably with a Weston clamp-ammeter unit model 633, type air-A2R, is now available from the Tagliabue Instruments Division, Weston Electrical Instrument Corporation, 614 Frelinghuysen Ave., Newark, N. J. for measuring and recording alternating current without breaking the circuit.



Designed to check on and make a permanent record of the use of alternating current and circuit reactions, the new TAG-Weston combination can be employed to cover all operations within a power, manufacturing, or processing plant as an aid in preventing wasted power, time, labor and money. The records obtained can reveal proper or improper handling of plant equipment, detect unwarranted use of power, and discover unnecessary waste of production line time by checking the starting and ending time of operating equipment.

"I think" is the most exaggerated and overworked expression in the English language.



DOWEL PINS

NOW AVAILABLE — in 1/4", 5/16", 3/8", 7/16", 1/2", 5/8" and 3/4" sizes in kiln dried Beech, Hickory and Hard Maple. Spiral grooved. Dowel Rods made from Hard woods in sizes 3/16" through 1-7/16" are now also ready for shipment. Let us quote on your requirements. Prompt Shipment.

BURROUGHS-ROSS-COLVILLE CO.
P.O. Box 271-A, McMinnville, Tenn.

SAVE MONEY
IN YOUR WOOD FINISHING DEPT.

Standardize on DETROIT HANDY "TAC" RAGS and stop losses due to rejections. Specify "DETROIT" for removing all particles of dust, lint and sand. Try this modern method today. Order from your supplier at once, or send for sample.

DETROIT HANDY "TAC" RAG

DETRO MFG. & SALES CO., INC., CULVER CITY, CALIF.

Hamilton
FACTORY TRUCKS

ESPECIALLY DESIGNED FOR THE WOOD-WORKING INDUSTRY

NO. 800

Cap. 1500 lbs.

Heavy Duty Wheels & Casters

Standard sizes 24" x 48"—30" x 48"—30" x 60". Special sizes and styles to order—capacities up to 7500 lbs.

Write for descriptive circular and low prices.

THE HAMILTON CASTER & MFG. CO.
1800 Dixie Highway Hamilton, Ohio

VULCAN
ELECTRIC GLUE POTS

Thermostat control

WATER JACKET TYPE

Heavy cast aluminum with attached bowl.

110-120 VOLTS or 220-230 VOLTS AC or DC.

One pint. One quart. Two quarts. Four quarts.

DRY TYPE

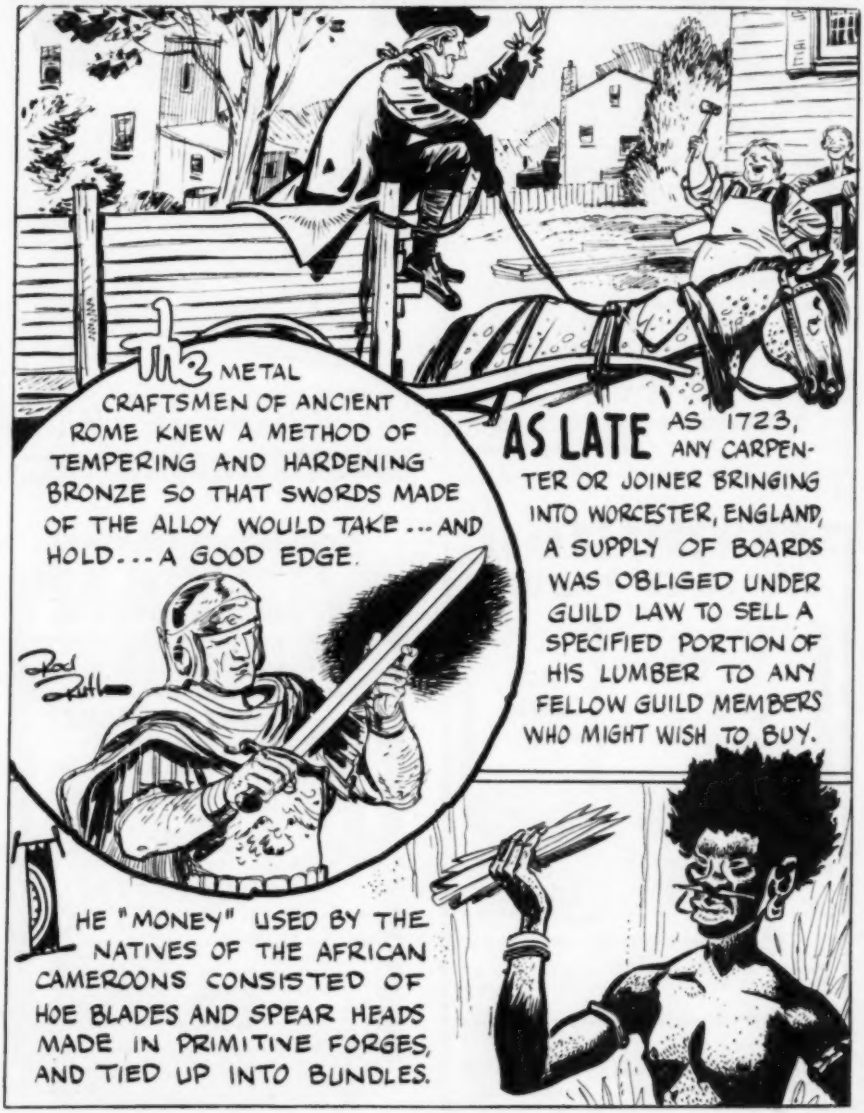
Heavy sheet iron body
Porcelain enamel glue container

110-120 VOLTS or 220-230 VOLTS AC or DC.

One quart. Two quarts. Four quarts.

VULCAN ELECTRIC CO
DANVERS 11, MASS.

Mechanics Through The Ages


THE METAL CRAFTSMEN OF ANCIENT ROME KNEW A METHOD OF TEMPERING AND HARDENING BRONZE SO THAT SWORDS MADE OF THE ALLOY WOULD TAKE ... AND HOLD ... A GOOD EDGE.
AS LATE AS 1723, ANY CARPENTER OR JOINER BRINGING INTO WORCESTER, ENGLAND, A SUPPLY OF BOARDS WAS OBLIGED UNDER GUILD LAW TO SELL A SPECIFIED PORTION OF HIS LUMBER TO ANY FELLOW GUILD MEMBERS WHO MIGHT WISH TO BUY.
HE "MONEY" USED BY THE NATIVES OF THE AFRICAN CAMEROONS CONSISTED OF HOE BLADES AND SPEAR HEADS MADE IN PRIMITIVE FORGES, AND TIED UP INTO BUNDLES.

They all use...

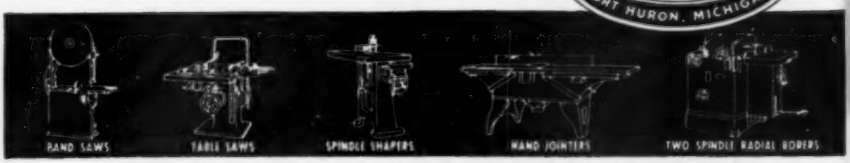
Moak High Speed Band Saws

FOR EFFECTIVE CUTTING OF A WIDE RANGE OF MATERIALS

A standard tool of woodworking shops, Moak High Speed Band Saws are proving their versatility in cutting such materials as pressed and plied boards, plastic laminates, corrugated paper, alloys, sheet metals and rolls of glass fibrous material. Functional design includes two-wheel equalized brakes for safety; "Lubricated for Life" bearings to cut maintenance costs. Wheel size is 36", available in three drives; also made with a 4-speed transmission.

Get the facts **on Moak Band Saws right away. Write for our colorful booklet.**

MOAK MACHINE & TOOL CO.
MOAK
PORT HURON, MICHIGAN



THE MARKET PLACE

FOR SERVICE
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FOR USED AND REBUILT EQUIPMENT

Rates for Classified Advertisements

Lists of Used and Rebuilt Machinery, either For Sale, Wanted, or For Exchange, set in uniform style, will be published in the Classified Section at the rate of $7.50 for name and address and a five line advertisement. For additional lines, only 75c per line.

DISPLAY ADVERTISEMENTS: 1 inch (Minimum), $8.50; 2 inches $17.00; 3 inches (Maximum), $25.00.

Write directly to those offering the machine for sale, for prices and full descriptions. If what you seek is not advertised, write Hitchcock Publishing Company, 222 E. Willow Ave., Wheaton, Ill., making known your wants on either new or used machinery and the publisher will gladly assist you.

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STANDARD of COMPARISON
THE "HART" LINE

Largest stock of used machinery in America, many ball-bearing, motorized. Substantial savings. Prompt shipment. Write for our list. We equip plants completely. We also buy complete plants or individual machines.

Earle Hart Woodworking Machine Co.
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Phone RAndolph 6-4970

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Victor Peterzell & Co.
1269 Culver Road Rochester 9, N. Y.

Borer, Amer. dbl. spdl, radial adj. horiz.
Clamp, 8'x4' Sash-Door, Hermance
Double Cut-Off Saw, Amer. No. 3, 7½ H.P. motor
Gang Variety Saw, American, b.d.
Lock Corner Machine, dbl spdl., Morgan No. 4
Moulder, 12" Woods No. 107, 40 HP motor
Nailer, Morgan No. 9, closed back,
Planer, Buss No. 4, sgl., 26"x7", sect. roll
Planer, Yates B-2, dbl., 30", rd, hds.
Planer-Matcher, Woods 14"x6", 40 HP
Ripsaw, Gang, Amer. No. 2, spur, b.b., dmd,
Ripsaw, Mattison No. 207 b.b. electric
Shaper, American double spdl. b.b,. d.m.d.

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Clifton Machinery Co.
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Saw Dust and Shavings Mill Exhausters and Blowers—Hundreds in stock, sizes to suit any need. Also Air Compressors, Fans, Rotary Blowers, Money Savers—Send Specifications.
All machines rebuilt and fully guaranteed.

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VICINITY ST. LOUIS, MISSOURI
AVAILABLE WITHOUT GOVERNMENT PRIORITY

16—Roller Conveyors, 10'
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1—Box Board Matcher, Used Hall & Brown No. 176
1—Nailing Machine, Used Doig 6-Track
1—Nailing Machine, Used Doig 11-Track
1—Box Board Printer, Used Two Color
1—Router, Used Yates-American No. U-90 MD
5—Skildrivers, Model 303 (Electric Screwdrivers)
2—Woodworkers, New DeWalt medium arm
1—Woodworker, New DeWalt standard arm
1—Woodworker, Used DeWalt standard arm
Subject to Inspection and Offer

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Dovetailer, Dodds 10-spindle, M.D.
Cutter Grinder, Mattison No. 231, 98% new
Glue cooker, 10-gal. Francis steam
Glue jointer, Jenkins No. 3CDA motorized
Hand jointer, 6" Wallace bench type, m.d.
Lathe, 30" Mattison No. 55-C, M.D.
Moulder, 6" Vonnegut 4-head, with hopper
Sander, 54" Nash No. 77 2-8pl. auto. turning
Swing saw, 6' Reliance with 3 HP motor dr.
Woodworker, Sidney Universal, five machines

FOR SALE

American Machinery Exchange, Inc
Woodworking Machinery—new & used
2040 — 2044 W. Lake St., Chicago 12, Ill.

Moulders, sanders, self-feed rip saws, band rips, routers, glue jointers, saw tables, planers, and many other items of new and used machinery.
Send us your inquiry.

FOR SALE

S. W. Harrington, Inc.

P. O. Box 230 **Asheville, N. C.**

Air Compressors, various sizes
Air Compresser, Gardner Denver 10x10 Twin dmd.
Bandsaw, Amer. 42" pb. bd.
Band Saw, Cordesman 30" pb. bd. & motor
Band saw, New Crescent 20" bb. dmd.
Band saws, Amer. B-36 36" bb. & motor
Band saws, New Moak 36" bb. dmd.
Borers, McKnight No. 88 dmd.
Borer, Amer. 2 spindle radial dmd.
Borers, Moak 2 spdle. horiz. bd.
Borers, Indiana 15 H 2 spdle. dmd.
Borer, Root 2 spindle horiz., dmd. style "K"
Boring & sawing, McKnight 26F dmd.
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Clamp, Handy No. 50 Cabinet Clamp
Clamp, Handy No. 406 Air oper. case clamp
Clamp, Handy No. 418 End clamp, air size 48x60
Clamp, Handy No. 31 End clamp, air
Clamp, Handy No. 71 Revolving Case Clamp
Clamp, Lancaster Bed panel air clamp
Clamp, Taylor, 40 sec. 4 clamps, 7 ft.
Clippers, Coe 88" bd. & motor
Dovetailers, Dodds, 10-15 and 20 spindle.
Frequency changers, 15 KW and 50 KW dmd.
Glue jointer, F&E No. 429, bb. dmd.
Glue jointer, Jenkins No. 343A bb. dmd.
Glue Jointer, Yates American No. 213 bb. dmd.
Jointer, Amer. 12" bb. dmd.
Jointers, New Moak 12", bb. dmd.
Lathe, Yates No. 74 bb. dmd.
Mortiser, W&M No. 285—5 spindle horiz. dmd.
Mortiser, Sidney, single spindle pb. bd.
Mortiser, Greenlee No. 228 Vert. bd. & motor
Moulder, Amer. No. 35—10" bb. dmd.
Planer-Matcher, Yates A1-15"x6" rd. hds. pb. bd.
Planers, New Crescent 24" bb. dmd.
F & E No 156 36x7 DMD head
Redrier, Merritt 12 plate 36x72
Resaw, Connell & Dengler Circular pd. bd.
Router, Defiance, 2 spindle bb. dmd.
Routers, Carter, floor type, Hvy. duty, electric
Routers, Yates-Amer. U-9 high speed
Router, Yates-Amer. U9 bb. dmd., High Speed
Sander, Berlin, 31" 3 drum, roll feed bd.
Sander, Mattison No. 134, pb. bd.
Sander, Mattison No. 138 Belt, hand, bb. dmd.
Sander, New Jefferson, hand block, bb. dmd.
Sander, Smith 49" 3 drum endless bed
Sanders, F & E 60" 3 drum roll feed, dmd.
Sander, Oakley Model H, 12" Horiz. Drawer, bb., dmd.
Sander, Mattison No. 172 edge belt bb. dmd.
Sander, B & M 14 flat sander & motor
Sander, 48" double disc, dmd.
Sanders, McKnight sgl. drum 24"x16" dmd.
Sanders, Nash No. 25—10 spdle. dmd.
Sanders, W&M No. 171 belt, pb, bd. & motor
Sander, W&M No. 171 Hand Block, pb. bd. & Mtr.
Sander, W&M No. 315 Edge Belt, bb., dmd.
Sander, Yates No. 427 Hand Block pb. bd. & Motor
Saws, Famous, cutoff, bb. dmd.
Saws, DeWalt cutoffs
Saws, New Delta-Crescent 12" tilt, arbor, dmd.
Saw, Beach Dbl. Cutoff, 8' bb., dmd.
Saws, Buss Tilt table Variety bb. dmd.
Saws, Yates G5 gang rip, pb. bd.
Shaper, Sherril Sgl. Spdle. bb. dmd.
Shaper, Defiance dbl. spdle., bb. dmd.
Shapers, New Moak single spindle, bb. dmd.
Spray Booths, 4—8x8x7 DeVilbiss, complete
Spray Booths, 3—7x8x7 DeVilbiss, comp.
Spray Booths, 2—6x8x7 DeVilbiss, complete
Amer. No. 1 6" one side, BD. PB.
Williamsport, w/plowing and Boring Att.
Taping machines, Dennis No. 2
Tenon Heads, single & double end.
Tenoner, NEW GREENLEE No. 545, bb., dmd.
Tenoner, Hayes dbl. 6 ft. pb. bd. with copes.
Tenoner, Hayes 6 ft. dbl. with copes, pb. bd. & mtr.
Tenoner, Jenkins No. 95, bb, bd. & Motor
Tenoner, F&E Sgl. with copes and motor pb. bd.
Veneer Eqpt., Black Bros. 24" Resin spreader, dmd.
Veneer Jointers, Jenkins Saw—6 ft. bd.
Veneer Press, Francis 84x48
Woodworker, Crescent, pb. bd.
Many other items, send your inquiries.

FOR SALE

Woodward Machinery Co.

309 E. Second St. Cincinnati 2, Ohio

Band saw, Crescent 20 in., $100
Band saw, Egan 34 in. with mtr., $175.
Band saw, Parks, 16 in., M.D., $75.
Borer, Andrews 60 in. 5 spdle. Hor. $350.
Borer, Andrews 8 spdle 60 in. ver. $450.
Borer, Andrews 42 in. vertical, 4 spdle., $350.
Jointer, Crescent 24 inch, $150.
Mortiser, Greenlee No. 228 Vert. HC automatic, $450.
Mortiser, Greenlee ft. fd. hor. hollowchisel, $175.
Morticer, N B No. 3 chain saw, $250.
Planer, American 30 in. sgl., $375.
Ripsaw, Greenlee self feed, $225.
Sander, Mattison No. 131 belt bd. block, $250.
Sander, Berlin, 42 in. 3 drum, $600.
Saw, Hamilton 20 in. heavy duty, Variety, $175.
Saw, DeWalt Radial 3 HP, $250.
Shaper, Delta, sgl. sp. BB MD, $185.
Shaper, New bench Atlas BB sgl., $37.50.
Tenoner, Houston sgl. end with 2 copes, $200.

FOR SALE

H. B. Smith Machine Co. Sander, 3 drum, 42" wide, continuous bed.

Vonnegut 5" Moulder equipped for Venetian blind ripping.

Plycor Steam Press, 10 opening 75" long, 50" wide with unloading rack

Black Bros. 8" Glue Spreader

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WOODCRAFT INDUSTRIES, INC.
Crockett, Texas

Only GENUINE parts
WILL KEEP YOUR
Jenkins
MACHINES
IN TOP CONDITION!

GENUINE JENKINS PARTS ARE MANUFACTURED AND STOCKED EXCLUSIVELY BY

JENKINS MACHINERY CO.
DIV. Curt G. Joa INC.
SHEBOYGAN FALLS, WIS.

FOR SALE

36" YATES-AMERICAN No. 1 Jointer, ball bearing, four knife round head with guaranteed 10 HP, 3600 rpm, 220/440. Serial No. B10547. Would make excellent facer.

Glue Jointer and Edge Moulder, YATES-AMERICAN No. 213, with two 5 HP, 3600 rpm, ball bearing cutter motors and vise grip heads. 1½ HP, 1800 rpm feed motor. Feed speeds 20/40/55/75 f/m. Jointer bar.

30" MATTISON 55C Automatic Shaping Lathe with guaranteed 10 HP, 1800 rpm, 220/440 motor. V belts, head and complete set of gears. Short feed rod, no center table.

24" AMERICAN Facer Jointer with JACKSON and CHURCH feeder. 5 HP, 3600 rpm arbor. Belted feed by 5 HP, 1800 rpm motor with slide rails. In good operating condition.

120" Beech Double Cutoff and 82 double mitre with two 5 HP, 3600 rpm, ball bearing tilting mandrels. Carriage travel 24".

TAYLOR glue wheel, 60 section, 96" with Gardner ratchet drive

ALL MACHINES FOR 220 v., 60 cy., 3 ph. EXCEPT WHERE NOTED

CARDINAL CO.
Fincastle Bldg., Clay 1608, Louisville 2, Ky.

FINE, MEDIUM PRICED
Tru-Form Relief
SHAPER CUTTERS

Precision-formed. Improved clearance. Razor-sharp, deep-hardened tool steel. Faster heat dissipation. 50% longer life. Permanently cut original shape, smooth, fast, clean. If your distributor cannot supply you, write

BOICE-CRANE COMPANY
931 Central Avenue Toledo 6, Ohio

Motor Driven
FREQUENCY CHANGERS
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STOCK

Sizes: 10 to 60 KW
Outputs: 90-100-120 and 180 cycle
Reliably Rebuilt
1 YEAR GUARANTEE
Attractively Priced
SAVE MONEY when you BUY any ELECTRICAL EQUIPMENT
We actually have one of AMERICA'S LARGEST STOCKS
Send us your Inquiries.

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SPECIAL CUT-OFF SAW
WILKIN-CHALLONER No. 720

Chain-feed, double-end cut-off saw. 144" x62" with 10 HP direct-connected saw arbor motors. Ball bearing. With provisions for tenons and copes.

WILCO MACHINE WORKS
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7½ ton capacity model RT150 Hyster Fork Lift Truck — 60" forks. Now in use. Available soon at Albert Lea, Minn. Will accept best offer. Write or wire

RILCO LAMINATED PRODUCTS, Inc.
First National Bank Bldg., St. Paul 1, Minn.

Diehl No. 75 Rip Saw
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Beach 8' Dbl. Cut off Saw BB 7½HP
Yates 24" Planer No. 152 10HP V Drive
Wysong & Miles Hollow Chisel Mort. 5HP power feed
Dodds 15 Spindle Dovetailer 3HP
Newman No. 31 Sqle. End Tenon. All Elec.
Pearson A-3 Moulding Sander, DMD
Yates No. 431 31" End Bed Sander 2-5HP & 7½ HP DMD
Colladay 36" Band Saw 3HP V Drive
Lancaster pneumatic end clamp. Table 48x66 3 cylinders
Union Port. Revolving Case clamp
Porter Router No. 666 1½HP Table 20x24
Lancaster pneumatic drawer clamp
Powers Saw table 3HP DMD
Oliver Scroll Edge Sander No. 190 DMD
Crescent 18" Dbl. Disc Sander 1¾ HP DMD
Double Horizontal Drill 5HP Belt Drive
Boice Crane 12" Planer 2HP V Drive
2 Craftsman Dr. Press Floor type ½HP
Montgomery Ward Saw Table ¾HP
2HP & 3HP Ingersoll Rand Comp.
Par 4 cyl. comp. 5HP
American 12 BB Jointer 3HP DMD
Wysong & Miles Double Buffer, 2 Vonnegut Heads
Simplex time Recorder and Siren

DERRY MFG. CORP.
FARMVILLE, VA.

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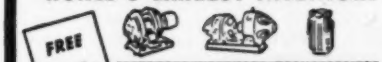

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Buss No. 4A 36" 6-roll single D.M.D.
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Superior 28" Single, Motor Driven
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MISCELLANEOUS
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Black Bros. No. 115 36"x84" Electric Veneer Press
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Sturtevant 48" Exhaust Fan, Motor Driven
Mattison No. 378 Universal Cutterhead Grdr., DMD

FADER WOODWORKING EQUIPMENT QUALITY

A. L. FADER & COMPANY

605 W. Washington Blvd., Chicago 6, Ill., Phone STate 2-7634

Rebuilding

AT ITS BEST!

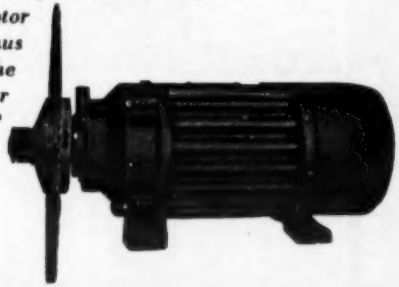
At Left, a partial view of our warehouse looking toward the rear, showing only about one-third of our stock.

Owing to our very large stock changing almost daily, we are omitting our stock list. We have about 350 new and used machines. Tell us exactly what you want, and advise phase, cycle and voltage of your current.

Here at Osborne & Sexton, you will find an organization skilled in the rebuilding of all types of woodworking equipment. Every machine as it enters the plant is carefully checked and inspected by men whose knowledge and experience make them familiar with every detail . . . just as doctors make a thorough diagnosis before a remedy is prescribed. All parts are then removed . . . in fact the machine is completely stripped to the frame. Every box is rebabbitted . . . every spindle ground accurately to size . . . drums, cylinders, heads, and pulleys are balanced . . . knives are ground and balanced . . . every shaft or stud showing signs of wear is replaced.

Modern production and rebuilding methods employed at O & S provide further assurance that the equipment which we literally "remanufacture and assemble" will meet your exacting demands. Every machine rebuilt or sold is guaranteed and must be satisfactory, as our users are the judges. Whether your machines require rebuilding, or you need machinery to help you meet the competitive situations which are ahead, be sure to contact Osborne & Sexton in Columbus. You will find a friendly organization . . . capable and willing to work with you on your engineering and production problems. Write us today.

MOTORS Totally enclosed, dust proof, fan cooled, ball bearing saw arbor motors, 3600 r.p.m. From 1 h.p. to 15 h.p. Measures only 3¼" from center of motor shaft to flatted top. Thus facilitating the use of the smallest possible diameter saw blade. (2, 3 & 5 HP motors available for quick shipment.)



A large stock of Standard Frame 3 phase motors and controls from 1 HP to 125 HP.

ENGINEERS AND RE-MANUFACTURER

The Osborne and Sexton

MACHINERY CO.
COLUMBUS 16, OHIO

"If it's for Woodworking . . . We Have It"

BAND SAWS: Walker Turner 14" B. B. M.C.
American 20"
Crescent 20" Ball Br. New
Northfield, 20" M.D. new
Lehman 30" Bab. Br. $125.00
Oliver No. 17, 30" ball br. Motor dr.
Wright 30"
Crescent 36" belt or motor
Fay & Egan No. 345 36"
Fay & Egan 48" Belt or Motor Dr.
Tannewitz 36" 7½ h.p. Motor D.M.D.

BAND RESAWS
Connell & Dangler 60" Vertical, $1800.00
Yates V-54" Vert. Band Resaw
7" Blades, 40 hp motor
40" Band Resaw

BORING MACHINES: Fay & Egan No. 190 Single Spl. Vert.
Andrews 32" vert. multiple
Andrews 32" Double Col.
Root Single Spl. Motor on Spl.
Dennis Sgl. Vert. Universal
Greenlee Post Borer

BOX MAKERS MACHINERY:
Beach Box Maker Carriage Cut Off
Hall & Brown Box Board Matcher

CLAMP CARRIER: Handy 12 ft. 6 wheel 18 leaves 6—31" clamps each 95% New

CLAMPING MACHINERY: American fig. 8853 8 ft.
Rowley & Hermance Door Clamp 3½ x 8 ft.
Lancaster Pneumatic Chair Clamp
Handy No. 100 Bed Clamp
Black Bros. Chain Clamps
3000 Spring Clamps No. 2 and No. 3

DADO SAWS: Fay & Egan No. 5 C.O. and Dado
American No. 1 Dado Saw Auto.
Hall & Brown No. 134 Comb. C.O. Dado Saw Pwr. Fd.

CUT OFF SAWS: Oliver No. 94-D St. Line C.O. Saw with Roller Tables 95% New
Greenlee No. 453 Auto. Railway C.O. 7" cap.
Comet Timber C.O. 10 h.p. 44" blade
Swing Cut Off Saws (several)
Fay & Egan No. 501 Motor Arbor Swing
Fay & Egan Table C.O. Saw

DOWEL MACHINES: Fay & Egan No 406 Rod Mach.
Hawker No. 2 Belt or Motor Dr.
American Clement ¼" to 1⅝" cap. with 11 cutter heads, $375.00

JIG SAWS: Oliver No. 173-B Ball Br. Self Contained Motor built in. New at Bargain Price
Beach No. 1 Tilting Table Scroll Saw

JOINTERS:
Crescent 12" B.B. 4 Knife
16" Fay & Egan No. 316 B.B. M.D.
16" American B.B. 4 knife Motor Dr.
Smith 16" 4 knife Jointer
Fay & Egan 20" rd. hd. Jointer
Fay & Egan No. 316 20" Rd. Hd. M.D.
Northfield (Late) 12" B.B. Motor on Hd.
Fay & Egan 24" No. 115 Belt or Motor Dr.
Moak 12" B.B. Jointer M.D., New

LATHE: Oliver 12"x5 ft. Sgl. Ph. Motor Headstock Goodspeed AV-4 Auto.
Goodspeed type AV-4 Automatic
Wood Lathe Sets 12" to 24" swing
Oliver No. 20—16"x8 ft. 4 speed M.D.
Goodspeed Variety Hand Feed
American No. 7, 32" Patternmakers

MORTISERS:
New Britain No. 4 Chain with H. C. Attach.
New Britain No. 7 Chain, Compound Table M.D.
New Britain No. 1 Chain Mortiser
Wysong & Miles No. 134 H. C. Auto. Feed
American No 20 H. C. Comp. Table M.D.
American H C. Horizontal Auto. Feed
Crescent Hollow Chisel Mortiser

MOULDERS:
American No. 3 Heavy 6" 4 side
Fay & Egan No. 207 7" 4 side
Fay & Egan No. 189, 10"x4-side $750.00
Hermance No. 30 8" 4 side Bab.
Hermance 10" 4 side
Fay & Egan No. 184 12" 4 side
Fay & Egan 10" 4 side
Smith No. 129 6" 4 s. M.D.
American 2 side Sticker

NAILING MACHINES:
Grammes 4 track Cigar Box Nailer
Doig 2 track Cigar Box Nailer
Doig 3 track Close Back Nailer
Doig 11 track closed back

PLANERS—DOUBLE:
Berlin No. 177 30"x12" $750.00
American 26"x8" Double

PLANERS—SINGLE:
Crescent No. 224 24"x6" Feed M.D.
Fay & Egan No. 2 24"x6"
Fay 20"x6"
American No. 1 20"x6"
L. Power 24"x6" Motor coupled Head
Powermatic 12"x4" M.D.
Sidney 18"x8"
Parks 12"x4"

PLANER & MATCHERS
Lehman 24" x 6" 3 side
Yates No. A66 20" x 6" B.B. 4 side

RADIAL SAWS:
NEW MULTIPLEX RADIAL SAWS IN STOCK:
No. 20-A ½ hp. single ph.
No. 30-A¾ hp. single ph.
No. 40-A 1½ hp single ph.
No. 50-A 5 hp., 3 ph.

RIP SAWS:
Falls No. 103 St. Line B. B. 15 hp. motor
Falls No. 103 St. Line B. B. Belt Dr.
Mereen Johnson No. 441 Gang
Greenlee No. 427 Self Feed
Skil Radial 5 h.p. New
Delta ½ h.p., 1 ph. Multiplex, Used

ROUTERS:
Porter No. 666 1½ hp., 2000 rpm
Kelley Elect. Stair Router 3 ph.
Cincinnati Elect. Stair Router
Hunter Elec. Stair Router $100.00
Duro Elect. Floor Type
Portable 1 hp. and 2 hp. New

SASH COPERS:
American Foot Power Sash Coper
Electric Bench Type Sash Coper

SAW FILING MACHINERY:
Foley Band Saw Filer
Wardwell Band Saw Filer
Covel Resaw 4" Tension Rolls
Power Band Saw Setter

SAW TABLES:
Yates-American No. 0 Variety Motor Arbor
Crescent No. 2, 3, and 5 Universal

SANDERS:
American-Col. 42" 3 drive
American No. 15 24" single dr. Hand Feed
American No. 15 30" single dr. Hand Feed
Berlin 42" 3 Dr. Motor Vee Dr.
Mattison No. 115 Variety Belt Sander
Wysong & Miles No. 171 Belt Sander
Yates American Comb. 15" disc & Drum M.D.
Yates No. 401 42" 3 Dr. Roll Feed
Wysong & Miles No. 303 Comb. 26" Disc

SHAPERS:
Crescent S-2 B.B. M.D.
Fay & Egan No. 265 Dbl.
Double Spindle B. B. Motors on spindle, 3600 or 7200 rpm
Porter No. 105 B.B. M.D. (late)

TENONERS:
Crescent T-3 Electric Tenoner
Powermatic B. B. Tenoner

TIMBER PLANER:
Yates P-12 12"x20" 4 side

VENEER CLAMPS:
5—38" 3 screws
4—29" 3 screws

ERVIN MACHINERY CO., INC.
124-26-28 Boulevard of Allies Pittsburgh, Pennsylvania

BORING MACHINES

Andrews 6 spindles 8' Horiz. foot feed
Bell BBMD No. 24 Double end, boring & chucking and sawing 54" capacity Model 24-A
Jones Superior radial, 1" to 16"
Prybill—radial 1" to 12" Single spindle horizontal

DOVETAILERS

Dodds 10, 15, 20 spindle

JOINTERS

American 12" Wedge Bed BB
American 16" Wedge Bed BB
12" Colloday L. Powers, HB Smith, Crescent Sidney

LATHES

Mattison 55C BB Live Tailstock

MORTISERS

Northfield chisel mortiser, motor driven
Wallace chisel mortiser, motor driven

MOULDERS

Mattison No. 224 9" all electric, hopper fd.
Eaglesfield 6" DMD BB All Electric
Yates American No. C55—18" all electric
Yates American C55 9" DMD All Electric
SA Woods No. 107 12" 5 heads, belt driven
S.A. Woods 701 all electric DMD12" x 4"
SA Woods No. 131 9", belt driven
American C4A 8"x4" B.D.

PLANERS

American Saw Mill 24" single DMD BB
Buss No. 4 BB 30" single Sec Feed & Chip CMD knife Grinder
Northfield 24" single, MD motor fd. No. 5
Smith 24" Facing Planer MD BB Power Fd.

PLANER & MATCHER

Fay & Egan No. 156 20"x8" 6 hds., belt dr.

SANDERS

Peerless 9" 14" and 20" horizontal
Peerless 9" 14" Vertical
Wysong & Miles, Oakley, Mattison belt
HB Smith 42" 3 drum, endless bed, MD BB No. 404
HB Smith 42" 3 drum endless Bed Plain Brg. belt drive
Yates No. 431 30" 3 drum endless bed belt drive

SAWS - CUT OFF

Porter C43 5 HP DMD BB
Beach 5 HP DMD BB
DeWalt BB DMD 10 HP with water pump and 2 vises Metal Cutting Model ME-2
Heston & Anderson No. 5, No. 25 & No. 55
Multiplex 5 HP DMD BB
Unipoint 3 HP DMD BB
Wallace 2 HP DMD BB
DeWalt 1 to 5 HP DMD BB
Jenkins No. 105A double cut off and mitre saw, 96"x60" MD motor feed BB

SAWS - BANDSAWS

American BB No. 4 40" rip and resaw
36" American, Tannewitz, Crescent, Oliver
27" Crescent Band Saw
Northfield BB & DMD 20" to 36"

SAWS - RIP SAWS

Diehl BB No. 77 DMD 15 HP
Sinker Davis, self feed gang, BB belt dr.
Mattison No. 207 BB MD Belt Feed
Hermance Straight Line Plain Bear., BD
Beach Self feed gang, DMD 15 HP BB

SAWS - VARIETY

American Saw Mill 5 HP DMD Tilt Arbor
American No. 10 tilt top belt drive
BM Root tilt top belt drive
Mereen Johnson, double tilt arbor, DMD BB with carriage
50 other makes to choose from

ROUTERS

Ekstrom Carlson New No. 232 & No. 337
Ekstrom Carlson Nos. 156 & 434
Onsrud W 240D

SHAPERS

McCartney BB 1 spindle
L. Powers single BB - MD
Union Single spindle BB MMBD
Whitney 2 sp. automatic BB MD No. 102
Yates N2 BB MD

TENONERS

Crescent single end, 5 head individual motor drive, BB
American No. 1 Single end belt driven
Newman single end BD

MISCELLANEOUS

Electric Carpenter 5 machine combination all ball bearing motor driven.
NEW—Taylor caterpillar clamp carrier 60 sections, 6½" centers 32" wide clamps, air rotation.
Jenkins Veneer Jointer
Evans Ring Joint Machine
Union case clamp.
Covel Hanchett Band Re-saw grinder MD
Greenlee & Amer. Door clamps, Sash clamps
Morgan Double Lock Corner No. 8
Fay & Egan No. 470 Jigsaw
Smith & Phillips pulley pocket machine

Endless canvas belts, large variety of lengths and widths, also sand belts for Skilsaw, Porter Cable and Vonnegut brush sanders. Accessories and supplies, tremendous lot both new and used. Also band and resaw blades.

WE PAY CASH FOR ENTIRE PLANTS OR INDIVIDUAL MACHINES

American Machinery & Motor Co., Inc.
22 HOWARD ST. NEW YORK 13, N. Y.

SCOTCH PRICES

(Denotes Better Buys)

Bandsaw, ballbearing, Tannewitz GH, 36", mtr.
Band Scroll & Resaw, 42", F. & E. No. 146, mtr.
Belt Sander, Wysong & Miles No. 275, b.b., 5 h.p., 1200 rpm mtr., used three months.
Borer, vert. dbl. col., Andrew No. 75, b.b. automatic, 60", 10 h.p., 850 rpm, mtr.
Borer, horiz., 2-spdl., Oliver, mtr.
Boxboard Printer, two-color, Hooper, 18"x28".
Boxboard Matcher, Morgan, 12 roll.
Clamp, frame, Handy 144"x36".
Clamps: Handy No. 35; Handy No. 195, mitre.
Cut-off Saw, dbl., Buss 72".
Cyclone, 8' wide by 9½' high, with mtr. and blower.
Dowel Gluer & Driver, Bell No. 8, mtr.
Dowel Machines, ballb.: Hawker No. 2, two mtrs.; Hawker No. 2, countershaft.
Factory Trucks, 4-wheel, 30"x60".
Glue Jointer, b.b., Yates-Amer. No. 213, 3 mtrs.
Jointer, incline bed, Newman No. 60, 16", 5 h.p. motor on cylinder.
Lathe, automatic, Imperial 31", 10 h.p., ballb.
Lathe, ballb., Mattison No. 53-A, 36".
Lock corner cutter, double end, B.&M., autom.
Mortiser, h.c., vertical Moak.
Mortiser, chain-saw, New Britain No. 3.
Mortiser, chain-saw, New Britain No. 3
Nailers, Morgan & Doig, 6 to 24-track, closed and open back with and without clinchers.
Panel raiser, F.&E., hand-feed.
Planer, sgl., F.&E. No. 156, ballb., 24"x7", rd. hd., 10 h.p electric grinder
Planer, sgl. Yates-Amer. B-7, 30"x7", 4 kn. rd. cyl., 20 h.p., 3600 rpm mtr., 7½ h.p. feed mtr., will feed 110 FPM.
Planer & Matcher, 4-s, F.&E. No. 40, 24"x6".
Ripsaw, self-feed, Sinker-Davis, 10 h.p.
Ripsaw, chain-feed, Diehl No. 55, two mtrs.
Routers, electric: Porter No. 612, 3 h.p., Ekstrom-Carlson No. 126, 1½ h.p.
Sander, 3-dr., e.b., Sheboygan 49", ballb., mtrs.
Sander, 3-dr., e.b., Smith 43", mtrs.
Sander, 3-dr., roll-feed, Berlin 42", motor
Sanders, 2-dr., Parks 36"; F.&E. 24"; Beach 38", ballb., coupled mtrs.
Sander, Pearson, built-in motor.
Sander, horiz., flat belt, B.&M., 20", 7½ h.p., b.b. mtr.
Sander, autom stroke, Mattison No 124, 8-foot.
Saw, mitre, dbl.-end, Dauber-Bell 72".
Shaper, 2-spdl., Whitney No. 134, freq. changer.
Shaper, autom., Onsrud WA-50-AS, nearly new.
Stapler, Saranac 4-head, 60", openback.
Surfacer, dbl., Egan 26"x12", endless bed.
Tenoner, sgl.-end, Greenlee No. 532-A, 4 mtrs., used one week.
Veneer Press, Francis, 102"x25", 5-sec, 10 screws.
Veneer Presses (4), Towsley 38", 3-screws.

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MODERN MACHINERY—BARGAIN PRICES!

Andrews 42" Vertical Gang Boring Mach.; six radial spdls.; three 16" ext. arms; foot and power feed; b-d.
Oliver No. 166—16" Direct Motor Driven Hand Jointer
Hermance 8" Four Side Moulder, plain bearings, square heads, belt driven
Mattison No. 55C, 30" Motor Driven Automatic Lathe.
Yates C-88 — 8"x4" Electric B.B. Moulder
Yates-American 57 Direct Motor Driven Ball Bearing Hand Lever Stroke Sander
Greenlee No. 495 Direct Motor Driven Ball Bearing Tilting Arbor Saw
Greenlee No. 426-G Motor Driven Gang Ripsaw, cpld. mtr. dr.
American 30" Facing Planer, ball bearing, MD, with Herzog Four Post Feeding Att.
Porter No. 300CM Motor Driven Ball Bearing 24" Facing Planer
Whitney No. 32—24" Motor Dr. Ball Brg. Single Cabinet Planer
Onsrud W-240 High Speed Electric Router
Porter No. 612 High Speed Electric Router with 2 h.p. motor
Superior No. 145—30" Motor Driven Disc Sander, tiltinn table.
Superior No. 35, 2 spindle, Radial borer, spiral gears, Motor Driven
Porter No. 43-20J Motor Driven Hydra-Cut Saw with tables
Mattison No. 138 Direct Motor Driven Hand Block Belt Sander
Wysong & Miles No. 315 Motor Driven Edge Belt Sander, 1 hp
J. A. Fay & Egan No. 50—36" Band Saw Machine, vee belt motor drive.
Mattison No. 244 Direct Motor Driven Straight Line Cut Off Saw, w/Steel tables
Diehl No. 75 Direct Motor Driven Ball Bearing Straight Line Ripsaw
Tannewitz 42" Direct Motor Driven, Ball Bearing Band Saw
Tannewitz Type GH and G3—36" Direct Motor Driven Bearing Band Saw
Greenlee No. 110—36" Direct Motor Driven Ball Bearing Single Surfacer
Billstrom 29 and 39-section clamp carriers.
Whitney No. 24—30" Motor Driven Ball Bearing Double Head Surfacer
Whitney No. 77, Motor Driven Ball Bearing Tilting Arbor Saw
Whitney No. 91 Motor Driven Ball Brg. Dbl. Spindle Shapers (2)
Onsrud W125 Mtr. Dr. Auto. Shaper, 84" capacity, with freq.
E. B. Hayes 78" Plain Brg. Dbl. End Tenoner, belted motor drive

GUSTAFSON & SCOTT MFG. CO.

1637 N. LOWELL AVE. **CHICAGO 39, ILLINOIS**

HERE ARE A FEW OF Earle Hart's

BIG VALUES

IN USED AND REBUILT WOODWORKING MACHINERY

* Indicates Ball-bearing and Motor Driven

BORERS—Horizontal & Vertical

Towsley two-spindle horiz. radial borer.
* Oliver No. 71—3-spindle horizontal borer.
Greenlee No. 368—30" Mult. Horiz. Borer.
Andrew 48" & 72" Mult. Horiz. Borer
* Wysong & Miles No. 283-B Vert. Sgl. Spl. Borer.
* Greenlee No. 386 6-ft. and 8-ft. vert. multiple borers
* Root Style B vertical multiple head borer.
* Greenlee No. 369—48" Vert. Mult. Borer.
Andrews 60" multiple vertical borer.

CHAIR MACHINERY

* McKnight double end sawing and boring machine.
* McKnight 4CM horiz. and vert. borer with double end sawing.
Pringle & Brodie horizontal borer.
McKnight No. 1E saddle seat machine.
Bell No. 8 dowel gluer and driver
Dauber-Bell dowel cutter and pointer.
* Nash chair seat angular borer.

CLAMPING MACHINERY

Taylor-Billstrom-Black 12-18-30-40 section clamp carriers.
Handy No. 447 Air Operated, 2-Way End Clamp.
Handy and Union revolving case clamps.

GLUE MIXERS & SPREADERS

Francis M-7 (75 gallons) Veg. Glue Mixer.
Union 36" and 60" Dbl. Roll Resin Glue Spreaders.
Francis 12-in. edge glue spreader.

JOINTERS

* Fay & Egan No. 506—12" hand jointer.
* Yates-American No. 213 Glue Jointer.
* Diehl No. 60 glue jointer.

LATHES

* Mattison No. 55-C Auto. Turning Lathe, B.B.
Mattison No. 210 copying lathe.

MORTISERS

Greenlee No. 228 Auto. Hollow Chisel Mortiser.
New Britain No's. 2 and 7 chain saw mortiser.
* Whitney No. 67 horiz. osc. bit mortiser.

MOULDERS

* Mattison No. 276—6-in. electric moulder.
* Vonnegut 6-in. electric moulder.
* Yates No. 108—10-in. heavy-duty moulder.
Yates CBA-4" BB Belt Drive Moulder
Hermance No. 50—8"—10"—12" drop bed moulders.

PLANERS—Facing

* Whitney No. 32—30" single planer.
* Porter 24" facing planer—Herzog feed.

PLANERS

* NEW Whitney No. 32A—30-in. single planer.
* Whitney No. 29—36-in. single planer.
* Greenlee No. 110—30" 6-roll single planer.
* Whitney No. 24—30" and 36" Double Planer.
* Whitney No. 33—40" Heavy Duty Dbl Planer.
* Yates-American No. 177—30" roughing planer.

ROUTERS

* Onsrud W-240 heavy duty electric router.
* Porter No. 600 and 610 heavy duty elec. router.
* Yates-American U-9 electric router.
* Onsrud W-265 Electric Router.

DRUM SANDERS

* Smith No. 404A—31" 3-drum endless bed sander.
Yates No. 431—31" and 43" 3-Dr. End. Bed Mtrzd.
* Solem S-3-M—73" 3-Drum Endless Bed Sander.
American No. 9—61" 3-drum roll feed sander, mtrzd.

SANDERS—Belt & Miscellaneous

* Wysong & Miles No. 663 Automatic hydraulic stroke
* Mattison No. 124 Auto. Stroke Sander
* Wysong & Miles No. 277 hand block belt sander.
Nash No. 10 & No. 25 Auto. Spindle Sanders.
American No. 11 horiz. surface sander.

SAWS—Band Scroll & Resaws

* NEW Crescent 20" Band Scroll Saws
* Superior 36-in. band saw—Carter wheels.
* Fay & Egan No. 50—36" band saw.
Mershon 54" vertical band resaw.
* McDonough 44" vertical band resaw.

SAWS—Cut-Off

* Porter 23-20J hydracut saw.
* Porter 43-208 straight line cut-off saw.
* Yates-American No. 5 Swing Saw.
* Jenkins No. 105-A Dbl. Cut-Off and Mitre Saws
Mereen-Johnson No. 435 6-ft. multiple cut-off saw, groover, and equalizer.

SAWS—Rip

* Mattison 205-207 and late model 202 straight line ripsaws.
* Yates-American G-77 straight line ripsaw.
Greenlee No. 426 self-feed ripsaw.

SASH & DOOR MACHINES

Bell No. 5-B stile and rail borer.
* Bell No. 11 power door clamp.
Bell No. 7 dowel driver and gluer.
Milbury pocket cutter.

VARIETY SAWS

* Whitney No. 61 tilting arbor variety saw.
* Fay & Egan No. 500 tilt-table variety saw.
* Tannewitz tilt-table variety saw, b.b.
* Baker Double Arbor Variety Saw, BB.
* Yates-American No. 8 saw and dado machine.

SHAPERS

* NEW Crescent No. S-2 Single Spindle Shaper.
* Porter No. 103 Single Spindle Shaper
* Porter No. 201 Double Spindle Shaper
* Greenlee No. 180 Double Spindle Shaper.
* Whitney No. 351 double spindle, 12½ HP motors
* Whitney No. 203 Automatic Single Spindle Shaper.
* Onsrud No. 124 automatic single spindle shaper.
* Whitney No. 305 automatic double spindle shaper.

TENONERS

Greenlee No. 531 single end tenoner.
* Wilkin-Challoner No. 70 - 84" double end tenoner.
* Jenkins No. 95 96-in. double-end tenoner.
Jenkins No. 96 60-in. double end tenoner, b-b.

VENEER EQUIPMENT

Dennis No. 2 veneer taper.
Francis 30"x72" Hyd. Veneer Presses.
Merritt 84x54—8—10—12 Plate Redriers
Mereen-Johnson No. 80 tapeless veneer splicer.
Francis 30x80-in. hand screw veneer press.
Large quantity "I" beams and turnbuckles.

MISCELLANEOUS MACHINES

* Jenkins No. 65 sash sticker.
Food Machinery Co. Model AC-2 boxmaker.
* Woods No. 227 side bead grinder.
NEW Hanchett No. 133 Auto. Band Resaw Sharpener

This is only a partial list. If the machine you want is not shown, write us.

THE "HART" LINE

Earle Hart WOODWORKING MACHINE COMPANY

565 WEST WASHINGTON BOULEVARD CHICAGO 6, ILL. RAndolph 6-4970

LATE MODEL MACHINES IN GOOD CONDITION

Jenkins No. 96—60"x36" Ball Bearing Belt Drive Double End Tenoner

Hayes 96"x40" Plain Bearing Belt Drive Double End Tenoner with 15 H.P. motor

Hayes 102"x60" Double End Tenoner

Mattison No. 55-C—30" Ball Bear. Auto- matic Shaping Lathe

Jenkins No. 65 Door Sticker

Jones-Superior No. 35 Two Spindle Horizon- tal Borer

Yates 5-7—6' Hand Lever Stroke Sander

Jones-Superior No. 145—30" Disc Sander

Diehl No. 75 B.B. Straight Line Chain Feed Rip Saw

Buss Double Cut-Off Saw

Wilkin-Challoner 72"x40" Electric B. B. Double Cut-Off Saw

Tannewitz 42" Ball Bearing Band Saw

Greenlee No. 495 Bb Variety Saw

Whitney No. 77 Ball Bearing Tilting Arbor Variety Saw

Crescent Dowel Machine with 5 H.P. Motor

Greenlee No. 110—36" BB, DMD Single Planer

Whitney No. 24—30" Motor Driven B. B. Double Planer

Porter 300-CM—24" Facer with Herzog Feeder

Fay & Egan 24" Jointer, with 7½ H.P. motor and Jointer Attachment

Mattison No. 244 BB Cut-Off Saw

Billstrom 6' 39 Section Clamp Carrier

Billstrom 7' 29 Section Clamp Carrier

O'LEARY & FLYNN

ROOM 1806 **666 N. LAKE SHORE DRIVE** **CHICAGO 11, ILLINOIS**

REBUILT AND USED MACHINES

BAND SAWS
Oliver No. 116, 36" D.M.D.
American B-36, 36"
Colladay & Crescent 36"
Jones-Superior No. 155, 42" M.D.

BORERS
Root "GM" Vertical Single Spindle
Towsley No. 3, 2-Spindle Horizontal Radial
Greenlee No. 368, 2-Spindle Horizontal M.D.
Keystone 3-Spindle Horizontal 1" centers

CARVER
Minnesota 20-Spindle Multiple Carver

CLAMPS
American 4'x8' Door Clamp
Lancaster No. 500 Air End Clamp

CLAMP CARRIERS
Taylor 7½ Ft. 40-Sec. Chain Type

GLUING MACHINES
Black 30-Gal. Gold Resin Glue Mixer

JOINTERS
8", 8", 12", 16", 20" sizes
30" with Billstrom Feeding Attachment
Yates Continuous Feed Glue Jointer

LATHES
Reed 16" Turning Lathe, 16" Swing

MORTISERS
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Fay & Egan No. 462 P.F. Hollow Chisel
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Hermance 6" 4-Side
4" & 6" Single Head Stickers

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Yates B-8 30" Single B.B. D.M.D.
Whitney 30" Double

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Wysong & Miles 16" Disc Sander
Curtis No. 11 Semi-Auto. Belt Sander
Curtis No. 6 Belt Sander, Motor Driven
Porter-Cable B-6 Irregular Belt
Yates No. 431 3-Drum Endless Bed 43"
American No. 2, 43" Roll Feed 3-Drum

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Porter Floor Type, with Table
Y-A C-44 Floor Type, with table
Root No. 248 Double, 32"x82"
Bell No. 12 Double Miter

SAWS—CHAIN FEED
Mattison No. 205, Motor Driven

SAWS—SELF-FEED
Root and American
Hermance No. 31 Adjustable Roll
Greenlee No. 426

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Tannewitz SJ Tilting Arbor
American Double Revolving Arbor
American No. 7½ Comb. & Dado
Beach D.M.D., Tilting Table

SHAPERS
Whitney No. 8 Double Spindle
American No. 1 Single Reversible
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Colladay & American Single End
W-C No. 70 Double End, Motorized

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Lathe, Propeller Fahlin 10' motor drive with wood patterns and jigs
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Planer single Fay & Egan 24x6 with 5 HP single phase motor
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Planer, single 16x6" Powermatic, New
Planer, single 24x6 Northfield No. 5, New
Planer, 12x4" Boice Crane No. 1022, New
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Radial Saws, New Multiplex No. 20A-30A-40A and 40B, single phase, 110-220 volts
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Rip Saw, Beach hd. fd., Wood Frame, 5 H.P. mtr.
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Sander, Nash No. 87-20"—4 spindle auto M.D.
Sander, Belt, Mattison hand block roller table
Sander, Fay & Egan belt, No. 553, Hand Block
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Mattison No. 244 Cut-off-Saw, B.B., D. M. D.
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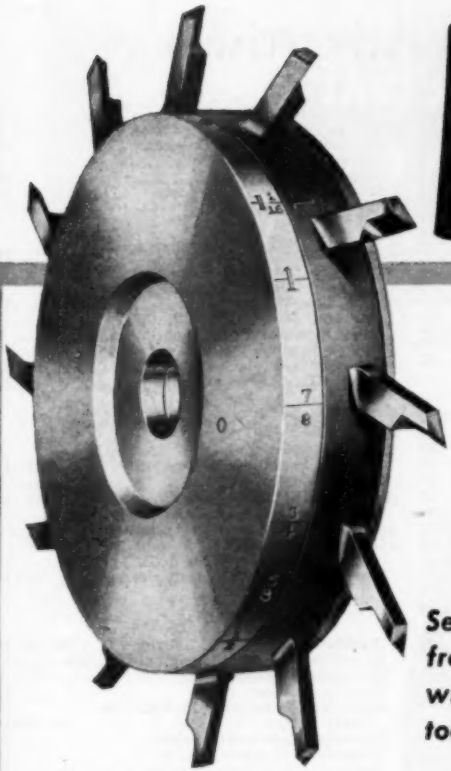

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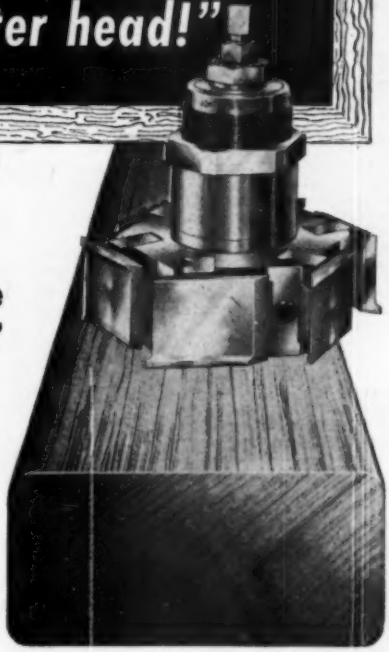

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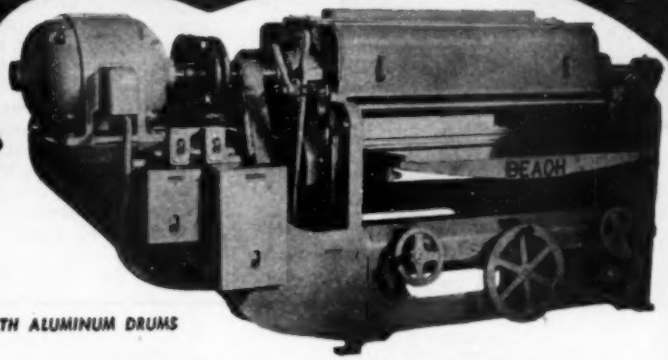
BEACH

TWO DRUM SANDER



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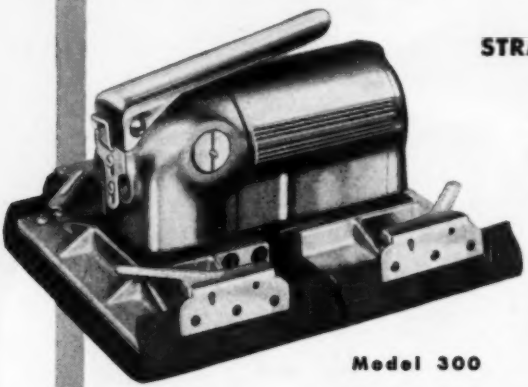

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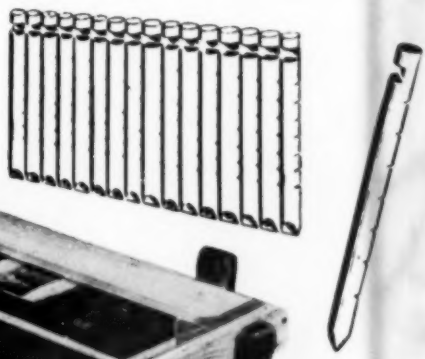

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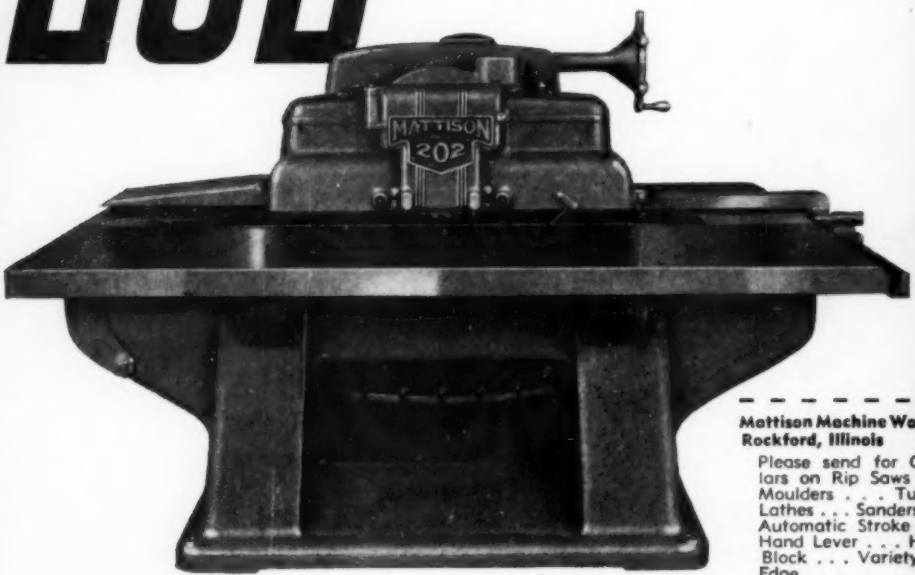

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